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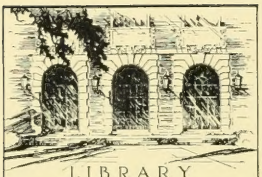

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ENGLISH BOTANY.

LONDON: PRINTED BY
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AND PARLIAMENT STREET

ENGLISH BOTANY;

OR,

COLOURED FIGURES

OF

BRITISH PLANTS.

EDITED BY JOHN T. BOSWELL SYME, F.L.S. ETC.

LECTURER ON BOTANY AT WESTMINSTER HOSPITAL.

THE POPULAR PORTION BY MRS. LANKESTER,

AUTHOR OF "WILD FLOWERS WORTH NOTICE," "THE BRITISH FERNS," ETC.

THE FIGURES BY

J. SOWERBY, F.L.S., J. De C. SOWERBY, F.L.S., J. W. SALTER, A.L.S., F.G.S.

AND

JOHN EDWARD SOWERBY,

ILLUSTRATOR OF THE "FERNS OF GREAT BRITAIN," "GRASSES OF GREAT BRITAIN,"

"WILD FLOWERS WORTH NOTICE," ETC. ETC.

Third Edition.

ENLARGED, RE-ARRANGED ACCORDING TO THE NATURAL ORDERS,
AND ENTIRELY REVISED.
WITH DESCRIPTIONS OF ALL THE SPECIES BY THE EDITOR.

VOLUME II.

RESEDACEÆ TO SAPINDACEÆ.

LONDON:
GEORGE BELL & SONS, YORK STREET, COVENT GARDEN;
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1873.

ENGLISH BOTANY.

ORDER VI.—RESEDACEÆ.

Annual or perennial herbs, or undershrubs. Leaves alternate, undivided, tripartite or pinnatifid, with a small tooth, probably a stipule, at the base. Flowers irregular, bracteate, white or yellowish, in terminal racemes or spikes. Calyx usually persistent, generally 6-partite, but varying from 4- to 8-partite; segments more or less unequally imbricated. Corolla with the petals generally equal in number to the segments of the calyx, the upper ones usually the largest, palmatipartite, the lower ones often simple; claw, especially in the upper petals, generally dilated, and having an inflexed scale-like appendage in front of the limb. Disk glandular, hypogynous, peltate or urceolate, generally most developed on the side next the axis of the inflorescence. Stamens 7 to 40, with the filaments united together at the base or free, often declinate. Anthers 2-celled, introrse, protruding in the bud. Ovary sessile or stipitate, of 2 to 6 carpels free or united together, in the latter case forming a syncarpous ovary with parietal placentæ. Ovules generally numerous, amphitropous or campylotropous. Fruit generally a dry leathery capsule, frequently open at the top, or consisting of several dehiscent follicles. Seeds generally numerous, kidney-shaped, exalbuminous. Embryo cylindrical, curved, with incumbent cotyledons.

GENUS I.—RESEDA. *Linn.*

Calyx persistent or deciduous, usually 6-partite, but varying from 4- to 8-partite. Petals unequal, divided into from 3 to many segments, the lower ones frequently simple and linear or rudimentary. Disk shortly urceolate, with the margin turned over at

the apex, especially on the side next the axis. Stamens 10 to 40, inserted within the opening of the disk. Carpels sessile or stipitate, 3 or 4 united into a 1-celled capsule open (before the seeds are ripe) at the apex, where there are as many teeth or lobes as there are carpels. Seeds numerous, kidney-shaped or obovate.

Erect or decumbent herbs, generally glabrous, with small racemose flowers having a single bract at the base of their pedicels.

The name of this genus of plants comes from the Latin word *resedo*. I appease, I quiet; from the notion that some of the species had this effect when medicinally applied.

SPECIES I.—RESEDA LUTEA. *Linn.*

PLATE CLXII.

Reich. Ic. Fl. Germ. et Helv. Vol. II. *Tetr.* Tab. C. Fig. 4446.

Stem with many ascending flexuous branches (rarely nearly simple and erect). Leaves entire at the base, divided about the middle into 3 narrow entire or pinnatifid lobes. Flowers in rather short and dense conical racemes. Pedicels spreading, longer than the divisions of the calyx, which are 6 in number, and scarcely enlarge after flowering. Petals 6, with roundish claws, the two upper ones 3-cleft, the two lateral ones 2-cleft or rarely 3-cleft, the two lower linear-entire. Capsule oblong-ovoid, narrowed below, 3-sided, papillose, with 3 teeth at the summit.

Waste places. Common in England, particularly on calcareous soils. Rare in Scotland, where it appears to be confined to the east coast, and not extending north of Forfarshire as a true native.

England, Scotland, Ireland. Biennial or Perennial. Summer.

Root a long tapering tap-root. Central stem erect, 15 to 30 inches high, solid, with raised lines, generally diffusely branched; lateral stems and branches arched at the base and ascending. Radical leaves in a rosette, soon decaying; stem leaves very numerous; all very variable in their mode of division, but commonly resembling a narrow strap-shaped leaf with 2 lobes of about the same breadth proceeding from about half way between the base and the apex, diverging at an acute angle from the main portion of the lamina, which they scarcely equal in length; from these lobes other smaller ones are frequently given off in an irregular manner, and all the lobes are undulated or rather crimped at the margins. Racemes shortly stalked, compact while in flower, lax in fruit; pedicels papillose, erect in fruit. Flowers pale sulphur-yellow, about $\frac{1}{4}$ inch across. Calyx segments linear-strapshaped, the upper ones smaller than the others. Upper pair of petals with

the claw enlarged so as to form a projecting lobe on each side of the lamina, which is divided into three portions: the central one linear, not above half the length of the lateral divisions, which are somewhat half-moonshaped, with the convex margin outwards; lateral pair of petals resembling the upper pair, but with the lower half-moon of the lamina often suppressed; lower pair of petals with the claw shorter than the others, and the lamina resembling the small central portion of that of the upper pair. Disk urceolate, produced into a ring-like plate at the top, which is much more developed on the side next the axis, where it forms a scale clothed with long slender white papillæ. Stamens 12 to 20, more or less bent down, longer than the petals. Stigmas 3 (rarely 4), sessile. Capsule shortly stipitate, $\frac{1}{2}$ to $\frac{3}{4}$ inch long, leathery, with the surface bossulated, opening at the apex long before the seeds are ripe, and having 3 projecting teeth round the margin of the opening. Seeds obovate, or rather ear-shaped, slightly compressed, black and shining. Whole plant lively green, glabrous (with the exception of small papillæ on the stem).

Wild Mignonnette, Yellow Mignonnette, Base Rocket.

French, *Réséda Jaune, Réséda Sauvage.* German, *Gelber Wau.*

Ray and Haller remark that this plant has an oleraceous taste resembling that of a cabbage.

SPECIES II.—RESEDA SUFFRUTICULOSA. *Linn.*

PLATE CLXIII.

R. undata, "*Linn.*;" R. alba, "*Linn.*;" and R. suffruticulosa, "*Linn.*" *Reich.* Ic. Fl. Germ. et Helv. Vol. II. *Tetr.* Tab. CI. Figs. 4447, 4448, 4449.

R. suffruticulosa et alba, *Linn.* Sp. Pl. p. 645.

Stems often several from the same rootstock, sub-simple or with erect branches. Leaves pinnatipartite, with numerous narrow entire lobes. Flowers in rather elongate and dense cylindrical-conical racemes. Pedicels ascending, about equal to the segments of the calyx which are 5 (rarely 6) in number, and scarcely enlarge after flowering. Petals generally 5, with short roundish claws, all wedge-shaped, 3-cleft, and nearly alike. Stigmas 4, rarely 3. Capsule oblong-urceolate, narrowed below, 4-sided with acute angles, and with 4 teeth at the summit.

Waste sandy places and rubbish heaps. Rare. It cannot be considered indigenous, but appears to be naturalized in a few places: as near Weston-super-Mare, in Somersetshire; Bootle, near Liverpool; and between Marazion and Penzance, Cornwall.

[England, Scotland, Ireland]. Biennial or Perennial. Summer.

Root a long tapering tap-root, often surmounted by a woody rootstock. Stems often somewhat woody at the base, erect, 18 to 30 inches high, hollow with raised lines. Leaves with 5 to 8 pairs of pinnæ, which are undulated at the margins. Flowering racemes rather longer than in R. lutea. Flowers dirty-white, about $\frac{3}{8}$ inch across. Petals with the claws very short and roundish, a little wider than the lamina, which is narrowly wedge-shaped and 3-cleft; the central division as long as the lateral ones, but not quite so broad. Disk short, funnel-shaped, with a narrow pulverulent margin turned over towards the side of the flower next the axis. Stamens 11 to 14, not all bent down, shorter than the petals. Stigmas usually 4, on short styles (or rather prolongations of the apices of the carpels), which are bent outwards. Capsule very shortly stipitate, contracted at the apex, about $\frac{1}{2}$ inch long, leathery, slightly bossulated, opening at the apex long before the seeds are ripe, and having 4 projecting teeth round the margin of the opening. Seeds reniform, somewhat compressed, dark brown or yellowish, opaque and finely roughened with concentric rows of small raised points. Whole plant glaucous-green, glabrous.

R. alba, Linn. (from his description) appears to be merely R. suffruticulosa with the calyx 6-partite and the petals 6 in number; R. undata of Reichenbach appears to be R. suffruticulosa with 3 stigmas instead of 4; but R. undata of Linnæus is probably distinct, as he describes it as a small plant about 1 foot high, with the lower leaves having the alternate segments smaller, the pistils from 3 to 5, and the capsules the largest of the genus.

Upright Mignonnette.

SPECIES III.—RESEDA LUTEOLA. *Linn.*

PLATE CLXIV.

Reich. Ic. Fl. Germ. et Helv. Vol. II. *Tetr.* Tab. XCIX. Fig. 4442.

Stem erect, sub-simple or with a few erect branches. Leaves strap-shaped, the lower ones attenuated at the base, all entire. Flowers in elongate and rather lax cylindrical spike-like racemes. Pedicels ascending, shorter than the segments of the calyx, which are 4 in number and do not enlarge after flowering. Petals generally 4 or 3, more rarely 5; the upper one cleft into 3 or more segments; the lateral ones with 3 segments; the lowest (when present), or more rarely the two lowest (when there are 5), linear-entire. Stigmas 3. Capsule sub-globular, depressed, divided nearly half way down into 3 triangular acute lobes.

Waste places. Not uncommon, especially on calcareous soils. In Scotland it extends as far north as the counties of Moray

and Ross, and in the neighbourhood of the Frith of Forth it is extremely common.

England, Scotland, Ireland. Biennial. Summer.

Root a long tapering tap-root, producing the first season a rosette of narrowly oblanceolate leaves undulated at the edges. Stem solitary, stiffly erect, 2 to 5 feet high, hollow with raised ridges. Stem leaves narrowly oblong or strap-shaped, entire (except the tooth-like adnate stipule at the base), the edges usually crimped. Flowering racemes very long and slender, with the flowers quite separate from each other by the time they open. Flowers very pale yellowish green, about $\frac{3}{16}$ inch across. Sepals applied to the petals. Upper petal with a concave scale-like claw and a limb cut into from 3 to 9 divisions; lateral petals with 3 or 2 segments, the one or two lowest generally quite simple when present, but occasionally with a small lobe. Disk urceolate, with scale-like glabrous margin turned over towards the axis of the raceme. Stamens 20 to 25, slightly bent down, about as long as the petals. Capsule about $\frac{1}{4}$ inch long, the carpels of which it is composed separate more than one-third of the way down. Seeds roundish-ovoid, dark brown, smooth and shining. Whole plant lively green, quite glabrous.

Wild Dyer's Weed.

French, *Réséda Gaude, Herbe à Jaunir.* German, *Färber-Wau.*

This plant is a near relative of the Mignonnette of our gardens; and although it has not the great charm of that fav ourite plant in its delicious scent, it nevertheless reminds us of it, and possesses properties which are more valued, though perhaps not so attractive. Linnæus observed that the nodding spikes of this plant follow the course of the sun even when the sky is clouded, pointing towards the east in the morning, to the south at noon, and the north at night. Under the name of Weld it has long been in use as a dye plant. In many parts of the country it is erroneously called Woad, which has given rise to some confusion respecting the true blue yielding plant of our forefathers, the Isatis tinctoria. The yellow dye yielded by the Weld is much used for silk, cotton and linen. Blue cloths are dipped into it in order to become green. The yellow colour called Dutch pink is obtained from this plant, which is now much grown in Essex and some districts of Yorkshire, being sown in April or May, and pulled up when nearly out of flower, and dried in the sun. The bundles of dried plants are sold under the name of Weld-herd. The yellow dye is generally prepared by making a decoction of the whole herb, but it seems to reside principally in the seeds. It is generally employed with alum and cream of tartar: and thus prepared, the colour is tolerably permanent, though it is always liable to fade by exposure to sunlight. An extract of the plant ground to powder is used by paper-stainers under the name of Weld Yellow; it is now obtained in a better form by mixing a decoction of the plant with a liquor formed by dissolving alum in water, and adding a solution of carbonate of potassa, the colouring matter being precipitated.

ORDER VII.—CISTACEÆ.

Small shrubs or undershrubs, rarely annual herbs, with the leaves generally opposite, entire, often furnished with small leaf-like stipules. Flowers nearly regular, white, yellow, rose, or purple, in terminal secund false-racemes or solitary, more rarely in terminal umbels. Calyx persistent, of 5 imbricated sepals; the two outer ones generally smaller than the others and sometimes suppressed; the three inner ones commonly convolute in æstivation. Corolla generally with 5 spreading very fugaceous petals, with scarcely any claws, crumpled, and convolute in a contrary direction to that of the sepals. Stamens indefinite, hypogynous; filaments free, thread-like; anthers 2-celled, introrse, dehiscing longitudinally. Carpels 3 to 5, completely united into a 1-celled free compound ovary, with the placentæ parietal or on the imperfect septa which sometimes project into the interior of the ovary. Style simply filiform, sometimes very short. Ovules generally indefinite, orthotropous, very rarely semi-anatropous. Fruit capsular, generally crustaceous, 1-celled, but sometimes with as many imperfect partitions projecting inwards as there are carpels; dehiscence loculicidal, dividing often quite to the base into as many valves as there are carpels. Seeds numerous, with a hard seed-coat and a little farinaceous albumen. Embryo once or twice bent or spiral, rarely nearly straight; radicle directed to a point opposite the hilum, except in the few species in which the funiculus is more or less adherent.

GENUS I.—HELIANTHEMUM. *Pers.*

Sepals 5, the two exterior smaller. Petals 5, equal. Stamens numerous, hypogynous, all fertile, or the exterior ones sterile. Ovaries with 3 placentæ. Capsule 3-valved. Embryo bent, or more rarely coiled.

Small shrubs or undershrubs, generally diffusely branched and decumbent, more rarely erect annuals. Flowers rather small, yellow or white in the British species, and disposed in terminal secund racemes.

The generic name is derived from ἥλιος (*helios*), the sun, and ἄνθος (*anthos*), a flower, because the petals open with the rising of the sun in the morning, and they fall off when the sun sets in the evening. The flowers only last for a few hours when the

sun shines; but if the weather be dull, and the sun does not make its appearance, the flowers remain unexpanded. Should this continue for several days, they will decay in the bud.

Sub-Genus I.—TUBERARIA. *Dunal.*

Petals much longer than the sepals. Stamens numerous, all fertile. Style straight, sometimes very short or absent. Funiculus thickened upwards. Embryo coiled almost into a ring.

SPECIES I.—HELIANTHEMUM GUTTATUM. *Miller.*

Plates CLXV. CLXVI.

Root annual. Stem herbaceous, erect, simple or somewhat dichotomously or trichotomously branched, with rather distant pairs of sessile elliptical or strap-shaped leaves, of which the lower ones are distinctly 3-nerved. Stipules none, or the upper leaves with small ones. Inner sepals with a faint nerve, numerous black glandular dots, and long white hairs. Petals yellow, usually with a red spot at the base. Stigma sub-sessile. Pedicels spreading or slightly recurved after flowering.

Sub-Species I.—Helianthemum eu-guttatum.

Plate CLXV.

H. guttatum, *Reich.* Ic. Fl. Germ. et Helv. Vol. III. *Cist.* Tab. XXV. Fig. 4526.
H. guttatum, *Auct. Plur.*
Cistus guttatus, *Linn. Sm.* Eng. Bot. No. 544.

Radical leaves oblanceolate or narrowly obovate; lower stem leaves elliptical; upper ones strap-shaped. Racemes without bracts at the base of the pedicels.

On dry banks. Very rare. Said to occur at Three-Castle Head, Cork; but I have seen no specimens. Rather plentiful in the western part of Jersey, and mentioned by Professor Babington as occurring in Alderney.

Ireland, Channel Islands. Annual. Summer.

Stem 2 to 12 inches high, in the larger specimens first dichotomously and then trichotomously branched. Radical leaves often withered by the time the plant flowers, narrowed into a short footstalk. Stem leaves sessile or sub-sessile, 1 to 2 inches long; the upper ones smaller, much narrower, often alternate, and with stipules at the base. Flowers $\frac{3}{8}$ to $\frac{5}{8}$ inch across, in a unilateral raceme. Sepals unequal, the two outer elliptical, the two inner ovate and twice as long as the outer. Petals wedge-shaped, yellow, usually with a deep red spot at the base. Fruit pedicels wiry, $\frac{1}{2}$ to $\frac{3}{4}$ inch long, generally slightly bent or curved

downwards. Capsule with smooth valves almost as long as the inner sepals.

The Jersey plant has the leaves with stellate pubescence, and the stem, peduncles, the upper surface of the leaves, and nerves on the lower surface, with long white spreading hairs.

Bractless Spotted Rock-Rose, or Sun-Rose.

French, *Hélianthème Taché.* German, *Getupfter Sonnengänsel.*

Sub-Species? II.—**Helianthemum Breweri.** *Planchon.*

Plate CLXVI.*

Planchon in Hooker's London Journal of Botany, Vol. III. Tab. XXI.

H. guttatum, var. *β*, *Hook. & Arn.* Brit. Fl. ed. viii. p. 45. *Bentb.* Handbook Brit. Fl. p. 107.

Radical leaves obovate; lower stem leaves obovate-elliptical, upper ones oblanceolate-strapshaped. Racemes with bracts at the base of each pedicel.

On dry banks. Very rare. Holyhead mountain, and near Amlwch, Anglesea.

England. Annual. Summer, Autumn.

Stems 1 to 4 inches high, simple or dichotomously branched, the larger examples with more than one stem from the same root. Leaves shorter, broader, and more enlarged towards the tip than in H. eu-guttatum; but the chief point of difference is the presence of strap-shaped leafy bracts at the base of the pedicels.

I am much inclined to agree with Dr. Walker Arnott and Mr. Bentham in regarding this plant as a variety of the preceding. I have specimens in which the bracts are absent from the base of at least some of the pedicels; while, on the other hand, Curtis's figure of H. guttatum (Vol. II. No. 102), is certainly the ordinary form of H. eu-guttatum with the bracteated raceme of H. Breweri. The few petals of H. Breweri which I have seen are precisely similar to those of H. eu-guttatum which I have gathered in Jersey. Of course, if H. Breweri be not even a sub-species, the "eu" must be omitted in Sub-species I., and it should be termed var. genuina.

Brewer's Spotted Rock-Rose.

Sub-Genus II.—PSEUDO-CISTUS. *Dunal.*

Petals longer than the sepals. Stamens numerous, all fertile. Style elongate, bent down at the base, and again upwards at the extremity, something like the letter S. Funiculus not thickened. Embryo bent into an S curve.

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* The Plate is drawn from an Anglesea specimen by Mr. J. E. Sowerby.

SPECIES II.—HELIANTHEMUM CANUM. *Dunal.*

PLATE CLXVII.

Cistus marifolius, *Linn. Sm.* Eng. Bot. No. 396.

Root perennial. Stems shrubby, procumbent, branched. Leaves opposite, shortly stalked, oval, elliptical, or oblong, with stellate pubescence and strigose white hairs. Stipules none. Inner sepals about twice as long as the outer ones, oval, acute, with distinct ribs clothed with white hairs but no black dots. Petals longer than the sepals, yellow, concolorous.

Var. α, *genuina.*

H. canum, *Reich.* Ic. Fl. Germ. et Helv. Vol. III. *Cist.* Tab. XXVII. Fig. 4534.

Leaves with a felt of stellate hairs both above and beneath, and with long strigose hairs on the upper surface, margins, midrib, and petioles. Sepals thickly covered with stellate pubescence and long spreading white hairs upon the ribs and margins.

Var. β, *vineale.*

H. vineale, "*Pers.*" *Reich.* Ic. Fl. Germ. et Helv. Vol. III. *Cist.* Tab. XXVII. Fig. 4533.

Leaves with a felt of stellate pubescence on the under side, nearly glabrous on the upper surface where there are a few white hairs as well as on the margins and midrib beneath. Sepals with stellate pubescence and short adpressed white hairs on the edges and veins.

On limestone hills. Rare. Var. α at Porteynon, Gower, in Glamorganshire; Great Orme's Head, Carnarvonshire; Disserth, Flint; Humphrey Head, Lancashire; Kendal Fell, Westmoreland. Var. β. on Cronkley Fell, Teesdale. One or other of these grows in Anglesea; probably var. α. A plant from Great Arran Island, Galway, is intermediate between var. α. and var. β, though nearer the former in habit.

England, Ireland. Shrub. Summer.

Stem procumbent, woody, diffusely branched; the flowering shoots herbaceous, 2 to 4 inches high, ascending or erect. Leaves $\frac{1}{4}$ to $\frac{3}{4}$ inch long, very variable in shape; those of the barren shoots narrower than those on the flowering ones, on the lower part of which they are sometimes even obovate or oval, though more generally elliptical. Flowers $\frac{3}{8}$ to $\frac{5}{8}$ inch across, in a sub-distichous raceme. Bracts small, sometimes absent. Style elongated, with a bridge-like bend at the base. Fruit pedicels spreading or reflexed, but inflexed at the apex, longer than the sepals. Capsule about as

long as the inner sepals, with the valves ciliated at the edge. Stems grey with stellate pubescence.

I am indebted to Mr. J. G. Baker for pointing out to me that the Teesdale plant is H. vineale, Pers. It has the leaves nearly wholly green on the upper surface, while in the ordinary form they are more or less grey. The Galway plant is very much more luxuriant than any specimens I have seen, with the petals fully twice as long as the sepals, which have numerous spreading white hairs; the leaves are broad and nearly destitute of felted stellate pubescence above. The European H. Oelandicum, Wahlb., H. Italicum, Pers., and H. canum, appear to be only sub-species at the utmost.

Hoary Rock-Rose.

French, *Hélianthème Blanchâtre.*

Sub-Genus III.—EU-HELIANTHEMUM. *Dunal.*

Petals much longer than the sepals. Stamens numerous, all fertile. Style elongate, bent upwards. Funiculus thickened upwards. Embryo bent, with the cotyledons straight, parallel to the radicle.

Species III.—HELIANTHEMUM VULGARE. *Gærtn.*

Plate CLXVIII.

Reich. Ic. Fl. Germ. et Helv. Vol. III. *Cist.* Tab. XXX. Fig. 4547.
Cistus Helianthemum, *Linn.* *Sm.* Eng. Bot. No. 1321.
Cistus tomentosus, *Scop.* *Sm.* Eng. Bot. No. 2208.

Root perennial. Stems shrubby, procumbent, much branched. Leaves opposite, shortly stalked, oval, elliptical, oblong, or strap-shaped, nearly flat, generally clothed with a felt of white stellate pubescence underneath and more or less numerous scattered white hairs on the upper surface and margins and on the midrib beneath. Stipules lanceolate-linear, ciliated. Inner sepals nearly three times as long as the two outer ones, obtuse, apiculate, nearly destitute of stellate pubescence, with distinct ribs clothed with woolly hairs, but no black dots. Petals much longer than the sepals, yellow concolorous.

On hilly pastures and rocks, preferring calcareous soils and such as are formed by the débris of trap rocks. Common, extending as far north as Ross-shire and Lanarkshire in Scotland, where it is most common on the eastern side.

England, Scotland, Ireland. Shrub. Summer and Autumn.

Rootstock thickened and woody, giving off much branched woody stems terminating in ascending herbaceous flowering shoots

3 to 6 inches long. Leaves ½ to 1½ inch long, very variable in shape. Stipules generally considerably longer than the petiole. Flowers ¾ to 1¼ inch across, in a unilateral raceme. Bracts narrow. Fruiting pedicels reflexed, about as long as the sepals. Leaves generally green above and white below, though a variety occurs which is green on both sides; but no British specimens of this have come under my notice. Stem and pedicels more or less thickly clothed with hairs. H. tomentosum is scarcely separable even as a variety. H. surrejanum (Eng. Bot. No. 2207) is a garden variety or monstrosity of H. vulgare.

Common Rock-Rose.

French, *Hélianthème Commun.*

The hardy species of this pretty genus of plants are among the most beautiful little shrubs for ornamenting rock-work, and deserve cultivation on account of the elegance and various hues of their blossoms.

SPECIES IV.—**HELIANTHEMUM POLIFOLIUM.** *Pers.*

PLATE CLXIX.

H. pulverulentum, *D. C. Reich.* Ic. Fl. Germ. et Helv. Vol. III. *Cist.* Tab. XXXIV. Fig. 4555.

Cistus polifolius, *Linn. Sm.* Eng. Bot. No. 1322.

Root perennial. Stems shrubby, procumbent, much branched. Leaves opposite, shortly stalked, elliptical, oblong or strap-shaped, with the edges more or less revolute, clothed with a dense felt of grey stellate pubescence beneath and a thinner one above, with scattered white hairs on the margins and on the midrib beneath; stipules linear. The three inner sepals thrice as long as the two outer ones, oval, obtuse, not apiculate, thickly clothed with stellate pubescence, with distinct ribs destitute of long hairs and no black dots. Petals much longer than the sepals, white with a yellowish claw.

On barren stony places. Very rare. Babbicombe and Torquay in Devonshire, and Brean Down, Somersetshire.

England. Shrub. Early Summer.

Very like H. vulgare but more wiry, the flowering shoots more woody and erect, the whole plant more densely clothed with pubescence, which with the white flowers and revolute-edged leaves render it easily distinguishable from that species.

The British plant is H. pulverulentum of De Candolle and Continental authors. H. Apenninum, D. C., is a variety, or perhaps a sub-species, with the leaves less revolute and, consequently, broader, greener above, and with the calyx less thickly clothed with stellate down.

White Rock-Rose.

French, *Hélianthème à Feuilles de Polium.*

ORDER VIII.—VIOLACEÆ.

Herbs or shrubs with alternate (rarely opposite) leaves, generally entire or crenate, more rarely laciniate. Stipules leaf-like or scale-like, usually deciduous in the shrubby species. Flowers often solitary, with 2 bracteoles on the pedicels, or arranged in cymes, racemes, or panicles; generally perfect but sometimes polygamous, irregular or regular. Calyx generally persistent, of 5 imbricated sepals. Petals 5, hypogynous or slightly adhering to the calyx. Perfect stamens 5, hypogynous or slightly perigynous; anthers sessile or sub-sessile, disposed in a ring and frequently united; connective often dilated and forming a membranous scale-like appendage beyond the anther-cells, which open by a longitudinal cleft, or very rarely by an apical pore. Staminodes present only in the sub-order Sauvagesieæ. Ovary free, sessile, 1-celled, with parietal placentas, generally 3 in number. Style simple; sometimes thickened or incurved at the apex, with a stigma on the under side; sometimes subulate, with a terminal stigma; more rarely cleft at the apex, or absent, so that the stigmas become sessile. Ovules on each placenta numerous, rarely 1 or 2, anatropous. Fruit a 1-celled capsule, opening by as many valves as there are placentas, rarely indehiscent. Seeds with a very short funiculus, and most commonly a hard or leathery testa; albumen fleshy, usually plentiful; embryo in the axis of the albumen generally straight. Cotyledons flat; radicle next the hilum.

GENUS I.—VIOLA. *Linn.*

Sepals 5, prolonged backwards beyond the point of insertion, persistent. Petals 5, unequal, spreading, with short claws; the lower one generally larger, and furnished with a spur at the base; the lateral ones often with a patch of hairs at the base of the lamina. Petals absent in the later flowers of some species. Anthers subsessile, forming a ring round the ovary; connective produced into a membranous scale at the apex; the two lowest anthers often spurred at the base, the spurs included in that of the lower petal. Style thickened at the apex, curved downwards, with the stigma on the under side, or dilated into a hollow knob, obliquely truncate at

the apex, with the stigmatic portion on the rim on the under side. Capsule opening loculicidally with a spring into 3 valves. Seeds roundish-ovoid, with a hard and generally shining testa, and a short dilated strophiole-like funiculus.

Annual or perennial herbs, or sometimes undershrubs, with alternate leaves and small or foliaceous stipules. Peduncles axillary, 1- (very rarely 2-) flowered. Flowers inclined, blue, purple, white, yellow, or variegated with these colours.

The word Violet is derived from a Greek word ἰον (*ion*). The ancients held a legend that Violets were the first food of the cow Io, one of Jupiter's mistresses.

Sub-Genus I.—NOMINIUM. *Gr. & Godr.*

Lateral petals forming a less angle with the lowest petal than with the upper ones. Style usually clavate and curved, with the stigma on the inner side, or (more rarely) dilated and excavated so as to form an oblique disk at the apex.

Herbs with or without distinct stems. Stipules scarcely leaf-like. Petalous flowers produced in spring or early summer, and often barren; the seed being produced from apetalous flowers, which appear later in the season.

Species I.—VIOLA PALUSTRIS. *Linn.*

Plate CLXX.

Reich. Ic. Fl. Germ. et Helv. Vol. III. *Viol.* Tab. II. Fig. 4491.

Rootstock creeping, rather thick, scaly, producing radical leaves and leafless peduncles. Scions few, short, slender. Leaves glabrous, on long stalks, nearly round or roundish-reniform, deeply heart-shaped at the base, rounded or with a very obtuse angle at the apex, faintly crenate. Stipules sub-membranous, broadly lanceolate, fringed with glandular hair-like processes. Style nearly straight, thickened towards the apex, where it is dilated into an obliquely truncate disk, and produced into a short beak on the upper side. Capsule oblong-ovoid, somewhat 3-sided, glabrous.

In spongy bogs, or more rarely in swampy woods. Common in the North; but rare or local in the South, although generally distributed.

England, Scotland, Ireland. Perennial. Spring and (apetalous flowers) Summer.

Rootstock white, somewhat fleshy, extensively creeping, emitting a few white leafless stolons, and producing at the apex a tuft

of a few leaves from 1 to 2 inches in diameter, on stalks 2 to 5 inches long; during summer the extremity of the rootstock elongates into a procumbent stem, and sometimes produces a few short scions, all of which lose their green colour and become rootstock by the time the plant is ready to flower in the succeeding spring. Scapes produced from the axils of the leaves, 2 to 6 inches high, with two small nearly opposite lanceolate slightly toothed bracts about the middle. Flowers drooping, about $\frac{1}{2}$ inch across. Sepals blunt, with the basal appendages short and rounded. Petals white or lilac, veined with purple, especially on the lower one, which is produced backwards into a very short obtuse spur. Anthers with orange appendages at the apex, the two lower with short green spurs at the base. Capsule splitting into 3 boat-shaped valves with the seeds in the middle furrow, $\frac{3}{8}$ to $\frac{1}{2}$ inch long, obtuse, glabrous, produced both from the petalous and apetalous flowers. Plant lively green, quite glabrous. Leaves somewhat shining, thin in texture. Sometimes, though rarely, runners like those of V. odorata are produced.

Marsh Violet.

French, *Violette des Marais.* German, *Sumpf-Veilchen.*

SPECIES II.—VIOLA ODORATA. *Linn.*

PLATE CLXXI.

Reich. Ic. Fl. Germ. et Helv. Vol. III. *Viol.* Tab. VIII. Fig. 4498.

Rootstock short, branched, scarred, producing radical leaves and leafless peduncles; scions always present, elongated, resembling runners. Leaves roundish-ovate, deeply cordate at the base, with an obtuse or somewhat acute angle at the apex, crenate, with short hairs on the veins, edges, and petiole. Stipules sub-membranous, lanceolate, with glandular hair-like processes on the margin. Bracts about or above the middle of the peduncles. Flowers fragrant. Style very little enlarged upwards, and slightly hooked at the apex. Capsule globose, downy.

In thickets and shady places. Not uncommon, but probably often of garden origin. It, however, appears to be undoubtedly wild in the South of England.

England, [Scotland,] Ireland. Perennial. Spring and (apetalous flowers) Summer.

Rootstock somewhat fleshy, with ring-like scars left by former leafstalks; from above these scars the scions are produced during the summer. These scions elongate, take root at the extremity (much as in the strawberry plant), and become independent plants, though still connected with the parent; after the second year, however, the intermediate part of the connecting stem decays, the

terminal portion becoming the rootstock of the young plant, which thus commences a separate existence. Scapes produced from the axils of the leaves, 2 to 4 inches high, with two small nearly opposite lanceolate denticulated bracts about, or above the middle. Flowers drooping, $\frac{1}{2}$ to $\frac{5}{8}$ inch across, bluish purple, lilac, or white. In the white variety the lateral petals are often destitute of the little hairy tuft, and in this state it is the Viola imberbis of Leighton, but it seems to be rather a state than a true variety. In the purple flowers the lower petal has darker lines at the base, but in the white these are not present. Spur of the lower petal very short, blunt. Capsule about $\frac{3}{8}$ inch in diameter, roundish, almost truncate or retuse at the apex. Plant rather deep green; the petioles, margins and veins of the leaves, the peduncles, the edges of the sepals, and the capsule, with short scattered hairs.

Sweet Violet.

French, *Violette Odorante.* German, *Wohlriechendes Veilchen.*

To describe the Violet, or to write of the qualities and useful properties of a flower so surrounded with the atmosphere of poetry and sentiment, is a somewhat difficult task; yet this pretty flower is not only valued for its beauty and delicious scent, but has its reputation in the practice of the healing art even at the present day. A syrup is made from the petals which is a favourite remedy for infantile disorders, and is certainly less dangerous than many which are administered by those who believe in doses. The root is a powerful emetic, and is frequently used to adulterate ipecacuanha. A dose of from forty to fifty grains of the powdered root acts powerfully. M. Boullay has discovered the presence of a principle called violine in all parts of the plant, analagous in external characteristics to the emeta of ipecacuanha, and possessing the same emetic properties. It is an alkaline substance, and forms salts by its union with acids; it is soluble in alcohol, but hardly so in water. The flowers of the Violet yield their purple colour to water, and form a good test for the presence of acids in the same way as litmus is used. In olden times they were used as remedies in many disorders, and were supposed to be especially serviceable to the eyes and in ague. Vitruvius tells us that the flowers were not only used to adulterate or counterfeit the celebrated blue of Athens, but were also employed to "moderate anger, to cure ague and inflammation of the lungs, to allay thirst, procure sleep, and comfort and strengthen the heart, as well as for cooling plaisters," besides being worn in garlands as a charm against the "falling sickness" and headaches. Pliny gives a long list of their virtues, affirming they are good for inflammation, cooling to weak eyes, quinsey, swellings, &c., and recommends the blossoms to be worn as garlands for the preservation of the head. The seeds were formerly believed to counteract the effect of a scorpion's sting. "Violets," says Gerarde, "have a great prerogative above others, not only because the mind conceiveth a certain pleasure and recreation by smelling and handling those most odoriferous flowers, but also for that very many by these Violets receive ornament and comely grace; for there be made of them garlands for the head, nosegaies, and posies which are delightful to look on and pleasant to smell to, speaking nothing of their appropriate vertues. Yea, gardens themselves receive by these the greatest ornament of all, chiefest beauty and most excellent grace; and the recreation of the mind which is taken hereby cannot be but very good and honest; for they admonish and stir up a man to that which is comely

and honest,—for flowers, through their beauty, variety of colour, and exquisite forme, do bring to a liberal and gentle manly mind the remembrance of honestie, comliness, and all kinds of vertues; for it would be an unseemly and filthy thing (as a certain wise man saith) for him that doth look upon and handle faire and beautiful things to have his mind not faire, but filthy and deformed." He goes on to enumerate the many excellencies of his favourite flower as a medicine: "Syrup of Violets," says he, "is good against inflammation of the lungs and brest, against pleurisie and cough." This belief has not shared the fate of most of our good friend's remedies; it is still given, and in the country is a favourite medicine for coughs and hoarseness. The French make great use of Violets in their *confitures* and household remedies; and we have seen and partaken of a delicate sweetmeat composed simply of the Violet flower prepared with sugar, yet retaining its delicious perfume. In the neighbourhood of Stratford-on-Avon Violets are largely grown for the purposes of perfume and as a colouring agent. The syrup forms a principal ingredient in the Oriental sherbet; and with this in view, probably, Mahomed asserts that the Violet is as superior to other flowers as he himself claimed to be over the rest of mankind. The association of the Violet with female beauty is of very ancient date; for, long before we read of "violet-like eyelids," we are told that the Britons used them as a cosmetic; for in a Celtic poem extant they are recommended to be employed, steeped in goat's milk, as a certain mode of increasing female beauty, perhaps by giving the blue tinge of woad to the complexion, then so much admired. Thus we see that it is not alone the external attractions of scent and beauty which have given its charm to the Violet, but a certain notion of its value as a useful plant. Shakespeare alludes to the Violet frequently and variously:—

"Violets dim,
But sweeter than the lids of Juno's eyes."

And again:—

"Lay her i' the earth;
And from her fair and unpolluted flesh
May Violets spring."

Violets find a very constant place in churchyards and on the resting-places of the dead, placed there by the hands of those who love to associate the ideas of purity and beauty with departed loved ones. Shelley says,—

"Lilies for a bridal bed,
Roses for the matron's head,
Violets for a maiden dead."

The Violet was a great favourite with the Greeks. Homer, as translated by Cowper, says,—

"Everywhere appeared
Meadows of softest verdure purpled o'er
With Violets: it was a scene to fill
A god from heaven with wonder and delight."

Athens was noted for its love of Violets,—"ancient Violet-crowned Athens." The same epithet was applied to the Muses; and Homer even calls Venus Ἰοστέφανον, —"crowned with Violets." Plutarch says: "Its exhalations greatly assist in removing affections of the head caused by wine." The Violet was the appropriate May-day prize bestowed on the troubadour, or the minnesinger of olden times. It was afterwards

replaced by a golden Violet; and at Toulouse a society was instituted, which afterwards became the Academy of Floral Games, in which this prize was striven for. The "true blue" of the Violet has ever been associated with fidelity; as in the old sonnet we have,—

"Violet is for faithfulnesse,
Which in me shall abide,
Hoping likewise that from your heart
You will not let it slide."

The sweet Violet and the sweet bird of song are associated not alone in poetic fancy, for it is a curious fact that where the Violet grows there may be heard the nightingale. Milton says:—

"In the Violet-embroidered vale
The love-lorn nightingale
Nightly her sad song mourneth well."

And who amongst us will not welcome the first Violets of the early spring,—

"Gleaming like amethysts in the dewy moss?"

SPECIES III.—VIOLA HIRTA. *Linn.*

PLATE CLXXII.

Reich. Ic. Fl. Germ. et Helv. Vol. III. *Viol.* Tab. V. Fig. 4493.

Rootstock short, branched, scarred, producing radical leaves and leafless peduncles; scions generally present, but usually very short. Leaves ovate or triangular-ovate, deeply cordate at the base, with an acute but rather blunt angle at the apex, clothed with short hairs on the upper and under surfaces, and with more numerous hairs of the same kind on the edges and peduncles; stipules sub-membranous, lanceolate, with glandular hair-like processes on the margins. Bracts below the middle of the peduncles. Flowers inodorous or very slightly fragrant. Style slightly thickened upwards and hooked at the apex. Capsule globose, downy.

In thickets and shady places, preferring calcareous or sandy soils. Rather rare; most frequent on the eastern side of the island, where it occurs as far north as Forfarshire.

England, Scotland, Ireland. Perennial. Spring and (apetalous flowers) Summer.

Extremely like V. odorata, but from the scions being very short it forms large tufts, the young plants growing close to the parents. The leaves are much narrower in proportion, more triangular, more deeply crenate, the sinus at the base more open, and the whole plant much more hairy, especially on the leafstalks. The spur of the flower is rather longer, and the bracts nearer the base of the peduncles. The capsules are frequently produced from the

petalous as well as the apetalous flowers. The leaves, after flowering, sometimes attain the length of 3 or 4 inches, exclusive of the footstalk.

A curious state of this species, var. β calcarea, Bab., grows on the Gogmagog Hills, near Cambridge: this is much smaller in all its parts, and has the petals very narrow. I am inclined, however, to consider it merely a state of the plant, as some specimens obtained this spring, which were planted in rich soil, already show a great increase of size, and it is very probable that the flowers also will more resemble the ordinary form; but should they continue small, it will, of course, have to be reckoned as var. β.

Mr. J. G. Baker has sent me from Seafield, in mid-West Yorkshire, a remarkable plant, which he supposes to be Viola sepincola of Jordan (Obs. sur Plantes Nouvelles et Critiques, Frag. VII. p. 8). This has the elongated scions of V. odorata, though otherwise it approaches nearer to V. hirta in the shape of the leaves and the pubescence. Can it be a hybrid between the two species? or are they, as Mr. Baker supposes, merely two sub-species, and this one of the connecting links? The scions, or runners, are not to be too much depended upon in the stemless Violets. I possess a specimen of V. palustris which has some exactly like those of V. odorata, though they are most often absent in the Marsh Violet.

Hairy Violet.

French, *Violette Hérissée.* German, *Rauhhaariges Veilchen.*

SPECIES IV.—VIOLA SYLVATICA. *Fries.*

PLATES CLXXIII. CLXXIV.

V. canina, "*Linn.*" *Hook. & Arn.* Brit. Fl. ed. viii. p. 47.

Rootstock slender, somewhat woody, slightly creeping, branched, each division terminating in an extremely short simple leafy stem, and also giving off from axillary buds elongated decumbent-ascending lateral stems, from the axils of the leaves of which peduncles are produced. Leaves stalked; the lower ones deltoid-roundish, acute, deeply cordate at the base; the upper ones deltoid- or triangular-ovate, acuminate, cordate at the base; all faintly crenate. Stipules small, sub-membranous, linear-triangulate, ciliate or fimbriate at the edges. Spur of the lower petal three or four times the length of the appendages of the sepals. Anther spurs narrow, longer than the anther together with its apical scale. Style thickened towards the apex and curved. Capsule oblong, apiculate, 3-sided, glabrous.

Sub-Species I.—Viola Riviniana. *Reich.*

Plate CLXXIII.

Reich. Ic. Fl. Germ. et Helv. Vol. III. *Viol.* Tab. XII. Fig. 4502.
A. G. More, in Report of Thirsk Nat. Hist. Soc. Bot. Ex. Club, 1861, p. 7.
Boreau, Fl. du Centre de la Fr. ed. iii. Vol. II. p. 78. *Brébisson*, Fl. de la Normandie, p. 38. *Lloyd*, Fl. de l'Ouest de la Fr. p. 56.
V. sylvatica *β*, Riviniana, *Bab.* Man. Brit. Bot. ed. v. p. 38.
V. canina, "*Linn.*" *Sm.* Eng. Bot. No. 620.

Lower leaves as broad as (or broader than) long; upper leaves a little narrower than long. Petals pale bluish purple, oval-oblong; the lowest one broadly oval, with numerous branched dark veins at the base; spur (usually yellowish white) broad, oblong, laterally compressed, furrowed, and slightly notched at the apex. Capsule with the appendages of the sepals prominent; those of the lateral pair longer than broad; those of the lower pair broader, and with 2 or 3 small notches at the apex.

In woods, hedges, and dry waste places. Very common throughout the whole kingdom, though in a few districts V. Reichenbachiana seems to be the more common form.

England, Scotland, Ireland. Perennial. Late Spring and (apetalous flowers) Summer.

Branches of the rootstock emitting a few root-fibres, but scarcely deserving to be called creeping; the extremities scarred and clothed with the decayed bases of the leaf-stalks. Primary stem with the internodes short, so that it often almost resembles a tuft of radical leaves, with a terminal leaf-bud; lateral stems from 2 inches to 1 foot long, decumbent and ascending, with developed internodes. Leaves of the barren primary stem on very long stalks, the lamina seldom longer than broad, the base with a large deep open sinus; leaves of the lateral stems on shorter stalks, especially the upper ones, which become narrower, more acuminate at the apex, and less deeply cordate at the base in proportion as they are placed higher on the stem. Peduncles long, straight nearly to the top, where there are a pair of small nearly opposite bracts, and then curved to the apex, so that the flowers are nodding. Flowers scentless, $\frac{5}{8}$ to 1 inch across, bluish purple or lilac, the lower petal paler at the base, with numerous dark veins which are distinctly branched. Upper sepal with a very short broad appendage; the lateral ones with a narrower and more rounded one; the lowest pair with the largest and broadest appendages, which are faintly toothed at the tip. Petals obovate-oblong, the lowest petal much broader than the others; spur much compressed, with the upper and under sides parallel, and generally a slight notch at the extreme apex.

Capsule about ½ inch long, with 3 faces, on each of which there are 3 furrows; valves at first boat-shaped, but the two sides close together, after the seeds escape; seeds brownish olive. Plant nearly glabrous, with a few very short scattered hairs on the upper surface of the leaf.

V. flavicornis, Forster, not Smith (Eng. Bot. Sup. No. 2,736), appears to be drawn from a small specimen of V. Riviniana; but Mr. H. C. Watson remarks that he is inclined to think that both V. Riviniana and V. flavicornis, Smith, have been before the draughtsman; the left-hand figure looking like V. flavicornis, but neither of them being satisfactory delineations of either of the two plants above mentioned.

Gerarde's Dog Violet.

French, *Violette de Rivin.*

Sub-Species II.—Viola Reichenbachiana. *Boreau.*

Plate CLXXIV.

V. sylvestris, "*Lam.*" *Reich.* Ic. Fl. Germ. et Helv. Vol. III. *Viol.* Tab. XII. Fig. 4503.
A. G. More, in Report of Thirsk Nat. Hist. Soc. Bot. Ex. Club, 1861, p. 7.
Boreau, Fl. du Centre de la Fr. ed. iii. Vol. II. p. 78.
V. sylvatica, *Fries. Lloyd,* Fl. de l'Ouest de la Fr. p. 56. *Brebisson,* Fl. de la Normandie, p. 38.
V. sylvatica α, Reichenbachiana, *Bab.* Man. Brit. Bot. ed. v. p. 38.

Lower leaves scarcely as broad as long; upper leaves decidedly narrower than long. Petals pale reddish purple, narrowly oblong; the lower one oval-oblong, with about 5 unbranched purple veins at the base. Spur (usually reddish purple, darker than the petals) clavate, laterally compressed without a furrow, and entire at the apex. Capsule with the appendages of the sepals very inconspicuous.

In woods and hedges. Apparently rare, though locally abundant in some districts, as in Cambridgeshire. It has been found, though sparingly, in most of the districts in which it has been searched for; as in the Isle of Wight, Thames Ditton in Surrey, and North Yorkshire.

England, Scotland? Perennial. Early Spring and (apetalous flowers) Summer.

This plant differs from V. Riviniana in its smaller flowers, with the petals much narrower in proportion, and of a redder tinge; the dark-coloured spur has the lower side nearly straight, and the upper slightly curved, so that it becomes thicker towards the apex. The most marked difference, however, is in the appendages of the sepals, which do not increase greatly in size after

flowering, as in V. Riviniana, in which plant, when the fruit is ripe, they are extremely conspicuous. The leaves also are rather narrower, and the time of flowering is somewhat earlier.

V. arenaria, D. C., which closely resembles V. Riviniana, but has a densely pubescent capsule, is reported to have been found in Teesdale by Mr. Backhouse; but I have seen no specimens, so that for the present, at all events, it appears better to leave it unfigured.

Reichenbach's Dog Violet.

SPECIES V.—VIOLA CANINA. *Bab.*

PLATES CLXXV. CLXXVI.

V. pumila, "*Vill.*" *Hook. & Arn.* Brit. Fl. ed. viii. p. 48.

Rootstock slender, somewhat woody, slightly creeping, branched, each division terminating in an elongated decumbent-ascending stem, from the axils of the leaves of which peduncles are produced. Leaves stalked, triangular-ovate with a cordate base, or lanceolate with a rounded or somewhat wedge-shaped base, bluntly crenate-serrate. Stipules small, sub-membranous or herbaceous, linear-triangular or elliptical-lanceolate, more or less laciniate at the edges. Spur of the lower petal scarcely two or three times the length of the appendages of the sepals. Anther spurs equal to or scarcely exceeding the anther, together with its apical scale. Style thickened towards the apex and curved. Capsule shortly-ovoid or roundish, obtuse, bluntly 3-sided.

SUB-SPECIES I.—Viola flavicornis. *Sm.*

PLATE CLXXV.

V. canina, "*Linn.*" *Reich.* Ic. Fl. Germ. et Helv. Vol. III. *Viol.* Tab. X. Fig. 1501.
V. canina, *Auct. Plur.*
V. canina α, *Bab.* Man. Brit. Bot. ed. v. p. 38.

Leaves ovate or triangular-ovate, cordate at the base; stipules linear-triangular, with a few small laciniæ. Petals oval-oblong, obtuse at the apex, purplish blue (or white). Spur of the lower petal about three times the length of the appendages of the calyx. Capsule ovoid.

On heaths, commons and sandy seashores. Rather rare, but pretty generally distributed as far north as Aberdeenshire and Forfarshire.

England, Scotland, Ireland. Perennial. Early Summer (apetalous flowers later).

Rootstock shortly creeping, giving off numerous branches clothed with brown scales; these branches do not produce a barren primary stem, as in V. sylvatica, but terminate in elongated simple or branched stems from 2 to 6 inches long. The leaves are narrower and firmer in texture than those of V. sylvatica, and much less deeply cordate at the base, but the lobes are always more or less distinctly produced and rounded on each side. The flowers are $\frac{5}{8}$ to $\frac{3}{4}$ inch across, and much bluer in colour than those of V. sylvatica; in form they closely resemble those of the sub-species V. Riviniana, but the spur of the lower petal, and consequently the anther spurs included within it, are shorter. The capsule, too, is generally shorter and more obtuse than that of any of the forms of V. sylvatica.

Dillenius' Dog Violet.

SUB-SPECIES II.—**Viola lactea.** *Sm.*

PLATE CLXXVI.

V. lancifolia, *Thore.* *Reich.* Ic. Fl. Germ. et Helv. Vol. III. *Viol.* Tab. XV. Fig. 4505

V. lancifolia, *Thore*, et *Auct. Plur.*

V. canina *β*, *Bab.* Man. Brit. Bot. ed. v. p. 39.

V. pumila *β*, *Hook.* & *Arn.* Brit. Fl. p. 48.

V. pumila, *Fries* (non *Vill.*), Mant. III. p. 123.

Leaves ovate-lanceolate, with the base rounded, not at all cordate. Stipules elliptical-lanceolate, laciniate. Petals oblong-elliptical, somewhat acute at the apex, pale greyish lilac; spur of the lower petal about twice the length of the appendages of the calyx. Capsule sub-globular.

On damp (?) heaths. Apparently very local. I have only seen specimens from Tunbridge Wells, Sussex; Flushing, Cornwall; and Bickleigh, Devon.

England. Perennial. Summer.

V. lactea certainly approaches very near some of the forms of V. flavicornis, but the shape of the petals and the shorter spur always afford marks by which to distinguish it, while in its usual state the different shape of the leaves is also conspicuous. It maintains its characters unchanged by cultivation.

Smith's Dog Violet.

French, *Violette Lactée.*

SPECIES VI.—VIOLA STAGNINA.

PLATE CLXXVII.

V. lactea, *Reich.* Ic. Fl. Germ. et Helv. Vol. III. *Viol.* Tab. XVI. Fig. 4507.

Rootstock creeping, extremely slender, thickened towards the apex, and dividing into numerous branches, each division termi-

nating in an elongated sub-erect and often branched stem, from the axils of the leaves of which peduncles are produced. Leaves stalked, oblong-triangular, or the upper ones strap-shaped-triangular; all truncate at the base and bluntly serrate. Stipules herbaceous, elliptical-linear, slightly laciniate at the edges. Spur of the lower petal not quite twice as long as the appendages of the sepals. Anther spurs shorter than the anther together with its apical scale. Style thickened towards the apex and curved. Capsule ovoid-acute, 3-sided.

In turf bogs. Rare. In the fens of Cambridge, Huntingdon, and Lincolnshire; and at Garryland, in Galway, Ireland.

England, Ireland. Perennial. Summer (apetalous flowers later).

Rootstock more slender than that of V. sylvatica or V. canina; the stems taller, more wiry, and more branched, from 3 inches to 1 foot high. The leaves are longer and narrower, more distinctly serrate, and have a distinct shoulder on each side near the base. The petiole is more distinctly winged down each side at the top. The stipules are larger and more leaf-like. The flowers are $\frac{1}{2}$ to $\frac{3}{4}$ inch across. Petals oval-oblong, blunt, very pale lilac, almost white. The spur of the lower petal and its included anther spurs are shorter than in either of the two species above mentioned.

Mr. Bentham unites V. sylvatica, canina, and stagnina under the name of V. canina; which, considering the great difference between V. sylvatica and the other two in the mode of growth, seems to be an unnatural combination.

Haller's Dog Violet.

Sub-Genus II.—MELANIUM. *D. C.*

Lateral petals forming a greater angle with the lowest petal than with the upper ones. Style straight, suddenly enlarged at the apex, forming a hollow ball or cup obliquely truncate at the mouth with the stigma on the lower edge.

Herbs or undershrubs, with distinct stems and large leaf-like stipules. Flowers during the whole summer with perfect petals, and producing seed.

SPECIES VII.—VIOLA TRICOLOR. *Linn.*

Plates CLXXVIII. to CLXXXI.

Rootstock none, or with subterranean divisions. Stems erect or ascending, simple or branched. Leaves stalked, elliptical, oval,

lanceolate or ovate, remotely crenate-serrate. Stipules large, leaf-like, lyrate or pinnatifid. Calyx with very large appendages, often as long as the tube of the corolla. Style short, straight, with a roundish excavated knob at the apex.

Sub-Species I.—Viola eu-tricolor.

Plate CLXXVIII.

V. tricolor, *Reich.* Ic. Fl. Germ. et Helv. Vol. III. *Viol.* Tab. XXI. Fig. 4517, *e, f, g.* V. tricolor, var. *a*, *Auct. Plur.*

Rootstock none. Stem elongated, branched (especially at the base). Stipules of all the leaves lyrate-pinnatifid. Petals longer than the spreading sepals. Capsule ovoid.

A weed in cultivated ground. Rather common, especially in the North of England and Scotland.

England, Scotland, Ireland. Annual (occasionally Perennial). Summer and Autumn.

Stems from 6 to 18 inches high, usually dividing close to the crown of the root into several succulent angular branches which are decumbent at the base and then ascending. Lower leaves generally broadly ovate, the uppermost elliptical or lanceolate, but all very variable in form, and with a few large shallow rounded serratures at the margins. Stipules irregularly pinnatifid, the lateral lobes usually considerably smaller than the terminal one, which is not unfrequently crenate, but occasionally quite entire. Flowers very variable in the size and relative breadth of the petals. The form common in Orkney has the flowers about an inch across, and $1\frac{3}{8}$ inch from the upper to the lower petals; but they are generally considerably smaller. The colour also differs much, varying from yellowish white with darker yellow on the lower petal and a slight shade of blue on the upper, to wholly purplish blue with the upper petals violet-purple, and a yellow spot at the base of the lowest petal which has usually 5 dark purple lines at the base, while the lateral ones have each 3. The spur is also very variable in length, but generally a little exceeding the appendages of the sepals. Capsule about $\frac{3}{8}$ inch long, more or less 3-sided. Plant bright green, generally with very small scattered hairs, and the edges of the stipules ciliated with stronger hairs; as is also frequently the case with the leaves and sepals.

I feel quite unable to identify Mons. Jordan's species with the British forms of V. tricolor from descriptions; and the only form belonging to V. eu-tricolor of which I possess an authenticated

specimen (Martin, Pl. des Environs de Lyon) is V. variata. (Jord.), which is identical with E. B. 1287.

Large-flowered Field Pansy, Three-coloured Violet, Heartsease.

French, *Violette Pensée.* German, *Dreifarbiges Veilchen, Stiefmütterchen.*

The old English names for this favourite plant are various: "Kit-run-the Street;" "Love-in-Idleness," which name still exists in Warwickshire, "Herb Trinity," from its tri-coloured flowers, and "Heartsease," from its supposed potency in love-charms. Doubtless it was this little plant to which Shakespeare attributes such wonder-working properties in the person of Oberon, king of the fairies:—

"Yet mark'd I where the bolt of Cupid fell:
It fell upon a little western flower,—
Before, milk-white; now, purple with Love's wound,—
And maidens call it, Love-in-Idleness.
Fetch me that flower; the herb I showed thee once:
The juice of it on sleeping eyelids laid,
Will make or man or woman madly dote
Upon the next live creature that it sees."

Again, we remember the poor love-lorn Ophelia, whose half-crazed wanderings have such plaintive tenderness of expression—

"There's Pansies, that's for thoughts."

The Heartsease is considered sacred to St. Valentine; and Robert Turner, an old author, says: "Both garden and wild kinds, while they are fresh and green, are cold and moist under the mild influence of Venus." The flowers were considered by old writers on Materia Medica to be cordial and good for diseases of the heart, or what passed for such; also as a remedy in epilepsy, ulcers, and cutaneous complaints. Some years ago, a writer in the "Medical Journal" called attention to the Heartsease as a valuable remedy for the cutaneous disorder called *crusta lactea* in children. For this purpose, half a drachm of the leaves, or a handful of the fresh herb, boiled in milk, was to be given every night and morning, and poultices made of the leaves to be applied externally. When strongly distilled, Heartsease exhales a smell resembling peach kernels. Whether it be fresh or dried, when distilled with water it gives a little volatile oil of a very acrid taste, having the same smell. The corolla yields to water its colouring principle in the same way as the other species of Viola. The Viola tricolor is one of the few of our British plants that has become a favourite in our gardens, and under the fostering care of the gardener has assumed larger proportions and much handsomer colours than it presents in its wild state. The cultivation of the Pansy is still encouraged, and at our annual village horticultural shows as well as the grander exhibitions of London, the most skilful cultivator of its tricoloured flowers comes in for a prize.

Sub-Species II.—Viola arvensis. *Murr.*

Plate CLXXIX.

V. tricolor, *Reich.* Ic. Fl. Germ. et Helv. Vol. III. *Viol.* Tab. XXI. Fig. 4517, *a, b, c, d.*
V. tricolor, var. *β, Auct. Plur.*

Rootstock none. Stems elongated, branched, especially at the

base. Stipules of all the leaves lyrate-pinnatifid; petals shorter than, or only equalling, the erect sepals. Capsule globular.

A weed in cultivated ground. Very common and generally distributed throughout Britain.

England, Scotland, Ireland. Annual (occasionally Perennial). Summer and Autumn.

Stem usually stouter and more erect than that of V. eu-tricolor. The whole plant paler green. The flowers smaller, $\frac{1}{4}$ to $\frac{3}{4}$ inch across, with the lateral and lower petals forced forward from the conniving of the four lower sepals. Petals white or yellowish-white, the lower one with a yellow spot at the base and 5 purple lines. Fruit peduncles more divaricate than in V. eu-tricolor. Capsule nearly globose, scarcely at all trigonous.

I feel very great doubts whether this can be separated as a sub-species from the larger form, but sown in a garden it shows no tendency to pass into it. V. agrestis (Jord.), contempta (Jord.), and segetalis (Jord.), appear to belong to V. arvensis. The root of this form not unfrequently lives through the winter, but does not even then produce a subterranean branched rootstock, as in the two following.

Small-flowered Field Pansy.

French, *Violette des Champs.*

Sub-Species III.—**Viola Curtisii.** *Forster.*

Plate CLXXX.

V. lutea β, Curtisii, *Bab.* (in part) Man. Brit. Bot. ed. v. p. 39.

V. tricolor, var. *Hook. & Arn.* Brit. Fl. ed. viii. p. 49. *Bab.* (in part), Man. Brit. Bot. ed. v. p. 40.

V. sabulosa, "*Boreau.*" *Baker*, in Report of Thirsk Nat. Hist. Soc. Ex. Club, 1859, p. 7.

Rootstock branched, with the branches tufted, producing rather short decumbent stems and short subterranean stolons. Stipules of the lowest leaves digitate-pinnatifid. Petals equalling or a little exceeding the sepals, spreading. Capsule oblong-ovoid, 3-sided.

On sandy seashores. Rare. In the West of England and in Ireland; Braunton Burrows, near Bideford, Devonshire; Llyn-Coron, Anglesea (with yellow flowers and small stipules); New Brighton, Cheshire; Portmarnock, near Dublin (with yellow, blue, and purple flowers, and small stipules); and Mullaghmore, Sligo, with yellow flowers and large stipules. Some of these forms probably occur at the Land's End, Cornwall, and at Cromlyn Burrows, Glamorgan; but I have seen no specimens from these stations.

England, Ireland. Perennial. Summer and Autumn.

This plant differs remarkably from the two preceding forms in branching below ground instead of above it, as they do. The lowest stipules are also shorter, with fewer lateral divisions. The terminal lobe varies in being entire or crenate; but as this occurs also in unmistakable V. eu-tricolor and V. arvensis, it cannot be deemed a character of any importance. The stems are shorter, more decumbent, and more decidedly rough with short hairs, than in the two preceding plants. The flowers have spreading petals, much larger than those of V. arvensis. In the Mullaghmore plant the flower measures 1 inch from the top to the extremity of the lowest petal. This form has been named V. Symei by Mr. Baker, and has the stipules much larger than those of the other plants here associated under V. Curtisii; but its mode of growth and form of the lowest stipules are precisely similar to that of the New Brighton and Port Marnock forms, which appear to me to be inseparable from the original V. Curtisii, *i.e.* that which is found at Braunton Burrows. Mr. J. G. Baker (who has paid much attention to the British Pansies, and to whom I am much indebted for copious notes respecting them, with which at my request he has kindly furnished me) has sent me a Pansy collected by himself near the Spital of Glenshee, Perthshire, which he believes to be V. lepida (Jord.), and which he is inclined to refer to Curtisii rather than V. eu-tricolor or V. lutea. This is the plant mentioned in the "Journal of Botany" for January, 1863, p. 11, where it is mentioned as having the "habit of growth of V. (eu-)tricolor, but yet apparently with a perennial root, and growing in a station suitable for V. lutea, in a meadow near the banks of a stream." Judging from the specimen, it appears to me to be referable to V. eu-tricolor, of which it has the habit and all the characters except the annual root; it is rather more hairy than usual, but the long erect stem branching above ground appears to me to give conclusive evidence as to which of the forms it belongs.

Sea Pansy.

Sub-Species IV.—**Viola lutea.** *Huds.*

Plate CLXXXI.

Reich. Ic. Fl. Germ. et Helv. Vol. III. *Viol.* Tab. XXIII. Fig. 4519.
V. suditica, *Wild.*

Rootstock branched, with the branches very slender, not tufted, producing short or rarely elongated ascending stems and long slender subterranean stolons. Stipules of the lowest leaves digitate-pinnatifid. Petals generally longer than the sepals, spreading. Capsule oblong-ovoid, 3-sided.

In grassy places. Common in hilly and mountainous districts. It occurs in Wales; Nottinghamshire and Derbyshire appearing

to be its southern limits. In Scotland it seems to be generally distributed.

England, Scotland, Ireland. Perennial. Summer and Autumn.

V. lutea differs from all the preceding in having a very slender creeping rootstock, but it appears to pass almost imperceptibly into V. Curtisii. Specimens from sandhills at Milton, co. Clare, collected by Mr. A. G. More, are quite intermediate between the two. These have the large yellow flowers (1⅛ inch long) of the ordinary form of V. lutea, when growing at low elevations; but the subterranean branching of the rootstock more nearly resembles V. Curtisii. The flowers vary from purple with a yellow spot at the base of the lower petal, to bright yellow with purple lines at the base of the lower and lateral petals, the former being certainly the more frequent form in Scotland. The leaves vary from roundish-deltoid (the lower ones) to narrowly elliptical. The height of the stem above ground seldom exceeds 6 inches, but a plant growing among bushes at Crookston, near Edinburgh (which has flowers varying from yellow to purple), has stems 15 or 18 inches high.

The Pansies are a good instance of the convenience of the employment of sub-specific groups; the difference between V. cu-tricolor, V. arvensis, and V. lutea is so great that Mr. Bentham is the only botanist who has united them: yet to get sharply-defined characters by which they may be separated, seems to be impossible; nevertheless, each has peculiar permanent features of its own. On this account it is convenient to speak of the whole of the forms collectively, considering them as belonging to one aggregate species; and also of each group individually, as something distinct from a variety, which is liable to change in a few generations.

Mountain Pansy.

ORDER IX.—DROSERACEÆ.

Small rather fragile herbs, often stemless, with the leaves in a radical rosette, or with an elongated stem having alternate or whorled leaves generally folded down on the petiole (almost circinnate) in æstivation. Leaves most frequently on long stalks, and generally covered on the upper side with hairs tipped with glands, or ciliated with weak bristle-like spines. Stipules none, unless a fringe of white scarious hairs on the upper side of the petiole represent them. Scapes from the axils of the leaves generally coiled up before flowering. Flowers regular, in a spike or raceme, rarely solitary or in an umbel. Sepals 5 to 8, persistent, imbricated in the bud. Petals 5 to 8, hypogynous, imbricated, withering. Stamens 5 to 8, more rarely 10 or 15, hypogynous. Carpels 3 or 5, completely united so as to form a 1-celled ovary. Styles 3 to 5, generally distinct, and each divided into two branches so as to appear twice as many, or all more or less united together: occasionally the branches are notched or multifid at the apex. Placentas parietal, with numerous anatropal ovules; or more rarely at the base of the ovary. Capsule opening loculicidally by 3 or 5 valves, or bursting irregularly at the apex. Seeds numerous (rarely few), sometimes with an arilliform testa; embryo minute, at the base of fleshy albumen.*

GENUS I.—DROSERA.

Sepals 5 to 8, slightly cohering at the base, persistent. Petals 5 to 8, oblanceolate, slightly spreading, marcescent. Stamens 5 to 8. Styles 3 (more rarely 4 or 5), bipartite, entire or notched at the stigmatic apex. Capsule 1-celled, dehiscing loculicidally by as many valves as there are styles. Seeds numerous, small, attached to the middle of the valves, obovate or elongate, rough or reticulated.

Small yellowish-green bog herbs, often stemless, with glandular hairs tinged with red on the upper side of the leaves. Flowers white, pink, or pale purple, distichous-secund, in spikes or racemes which are curled round before flowering. Whole plant turning nearly black in drying, and staining the paper dull red.

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* Parnassia seems very ill placed in this Order; and, of course, if it be excluded, there can be no reason for placing Droseraceæ along with the Saxifragaceæ.

The name of the genus comes from δρόσος (*drosos*), dew, because the plants appear as if covered with dew, in consequence of their leaves possessing elongated hairs, on the enlarged heads of which drops of moisture collect.

SPECIES 1.—DROSERA ROTUNDIFOLIA. *Linn.*

PLATE CLXXXII.

Reich. Ic. Fl. Germ. et Helv. Vol. III. *Cist.* Tab. XXIV. Fig. 4522.

Leaves spreading horizontally, roundish or transversely ovate, abruptly attenuated into long footstalks which have a few hairs on their upper surfaces. Scapes erect from the very base, much longer than the petioles. Capsule about as long as the sepals, ovoid. Seeds elongate-fusiform, with a loose reticulated chaff-like testa.

In spongy bogs and wet heaths. Common wherever the conditions for its growth are favourable.

England, Scotland, Ireland. Perennial. Late Summer.

Rootstock vertical, very slender, producing at the extremity a very short stem, so that the leaves appear to be in a radical rosette. In plants which do not flower, however, the leafy stem is frequently 1 inch or more long. Leaves with petioles from 1 to 2 inches long, with a fimbriated membrane near the base (probably representing stipules), and generally a few hairs on the upper surface, especially near the top; in direction horizontal when growing, but reflexed when the plant is pulled up; lamina of the leaf $\frac{3}{8}$ to $\frac{5}{8}$ inch across by $\frac{1}{4}$ to $\frac{1}{2}$ inch long, glabrous below, with rather short erect hairs tipped by red glands on the upper surface, and longer red spreading hairs round the edge; the young leafstalks are suddenly incurved at the top, so that the lamina of the leaf which is folded together is pressed against the upper part of the leafstalk, and all the hairs are neatly folded inwards. Scapes from the axils of the leaves 3 to 6 inches high, slightly flexuous, bearing from 3 to 15 flowers arranged alternately in two rows on one side of the spike-like raceme, at first coiled inwards, but straightening as the flowers open. Bracts subulate, deciduous. Pedicels much shorter than the sepals. Sepals narrowly oblong, nearly distinct at the base, slightly denticulate near the apex. Flowers nearly erect, about $\frac{3}{16}$ inch across, white, star-like, with the petals a little longer than the sepals. Styles short, incurved, bifid, with the segments slightly clavate and entire. Capsule oblong-ovoid, acute, a little longer than the sepals, but shorter than the withered persistent petals. Seeds numerous, very much elongated, with a loose netted brownish seed-coat. Whole plant yellowish green, often tinged with red, especially on the hairs on the upper surface and margins of the leaves: these hairs, in hot weather, secrete a gummy fluid, but the leaves certainly do not close and entrap insects, as do those of the Venus' Flytrap of Carolina, though this has been stated to be the

case. No doubt the mistake has arisen from observing insects sticking to the viscous summits of the leaf-hairs.

Round-leaved Sundew, Red Rot.

French, *Rossolis à Feuilles Rondes.* German, *Rundblättriger Sonnenthau.*

In the most unpromising situations, amidst boggy swamps and dreary morass, there we find this pretty plant sparkling beneath the sunlight, every leaf appearing as though fringed with diamonds. The little inflexed red hairs at the margin of a leaf each exude a drop of moisture, which gives rise to the common English name. This fluid is somewhat sticky, and unwary insects lighting on the plant are unable to leave it, and the leaves are observed to contract or shrink slightly when touched, so that it appears as though they would more closely entrap the unlucky prisoner. The contractile nature of the leaves of the Drosera is confirmed by a number of observers; and Dr. Withering, in his "Botany," gives the details of numerous experiments on the subject. Probably the sensitive condition of the plant is not so observable in our British species as in those of warmer climates; but certain it is that numbers of dead insects are constantly found sticking to the leaves, and that on warm sunny days, on touching the surface with a pin or any other object, the leaves may be seen to contract, and the little red bristles to close round in a very remarkable manner. Belonging as the Drosera does to a very irritable family of plants, numbering among them the celebrated Venus' Flytrap (Dionæa muscipula), we can scarcely be unprepared for this peculiar characteristic in our British species. To find this beautiful plant in its native morass requires something more than ordinary care; it is generally so entangled with moss and other little bog plants that it may easily escape undiscovered; when found, however, it well repays an attentive observer, and if carefully removed in a mass and placed in a saucer or plate well supplied with moisture and covered with a glass, we have a pleasant botanical study and a beautiful object for days or weeks before us:—

> "By the lone fountain's secret bed,
> Where human footsteps rarely tread;
> Mid the wild moor or silent glen,
> The Sundew blooms unseen by men."

The Sundew is acrid and caustic, and is said to burn away corns and warts; it was valued of yore as a cosmetic, and was used to curdle milk in the same way as rennet. In the days of Gerarde it was commonly used as a counterirritant. He says: "The leaves being stamped with salt, do exulcerate and raise blisters to what part of the body soever they be applied." He goes on to say: "The later physicians have thought this herbe to be a rare and singular remedy for all those that be in a consumption of the lungs, and especially the distilled water thereof; for as the herb doth keep and hold fast the moisture and dew, and so fast that the extreme drying heat of the sun cannot consume and waste away the same, so likewise men thought that herewith the natural and radical humidity in men's bodies is preserved and cherished. But the use thereof doth otherwise teach, and reason sheweth the contrary; for seeing it is an extreme biting herb, and that the distilled water is not altogether without this biting quality, it cannot be taken with safety; for it hath also been observed that they have sooner perished that used the distilled water thereof than those that abstained from it and have followed the right and ordinary course of diet." The Sundew is the plant of which Burton says, in his "Anatomie of Melancholy," that "Bernardus Perrottus prefers his *herba solis* before all the rest (of herbs) in this disease (melancholy), and will admit of no herb

upon the earth to be comparable to it." The Sundew was formerly much used as a tincture, to obtain which it was distilled with wine and then spiced and sweetened. In this way a most stimulating spirit was produced, and the plant is still employed in the manufacture of the Italian liqueur "rossoli." There is a notion in some parts of the country that a disease called "red rot" in sheep is produced by this plant; but as those animals never eat it, the complaint can only be the result of the miasma arising from the marshy and boggy ground on which the Drosera grows. The anatomy of the hairs of the leaves of the Sundew will well repay the attention of the microscopic observer. These hairs are an exception to the general structure of the hairs of plants, which are composed entirely of cellular tissue, and are a development of the epidermis of the plant. It will be found, however, that the hairs of the Sundew contain in their interior spiral vessels, so that they are prolongations of the fibro-vascular portion of the leaves, and not of their cellular part only.

SPECIES II.—DROSERA ANGLICA. *Huds.*

PLATE CLXXXIII.

D. longifolia, "*Linn.*" *Reich.* Ic. Fl. Germ. et Helv. Vol. III. *Cist.* Tab. XXIV. Fig. 4524.
D. longifolia, "*Linn.*" *Koch*, Syn. Fl. Germ. et Helv. ed. ii. p. 97. *Fries*, Sum. Veg. Scand. p. 33. *Gr. & Godr.* Fl. de Fr. Vol. I. p. 192.

Leaves ascending or sub-erect, wedgeshaped-oblanceolate or strapshaped-oblanceolate, gradually narrowed into long footstalks which are glabrous. Scapes much longer than the leafstalks, erect from the very base. Capsule longer than the sepals, pyriform-ovoid. Seeds fusiform, with a loose reticulated chaff-like testa.

On wet heaths. Not uncommon in the North and West of Scotland, becoming more rare in the East; and apparently absent from the South-East of England, where the counties of Norfolk, Bedford, Somerset, Devon, and Glamorgan appear to be the limits.

England, Scotland, Ireland. Perennial. Late Summer and Autumn.

Rootstock vertical, slender, producing a short stem bearing leaves and scapes which appear to be radical. The leaves, including the leafstalks, are from 2 to 4 inches long and erect; the laminæ not exceeding ¼ inch, and usually much less at the broadest part, which is a little way above the abruptly-rounded tip, while the base tapers so gradually into the footstalk that it is difficult to say where the one begins and the other ends. The scapes are considerably taller than the leaves, from 4 to 8 inches high. The flowers much resemble those of D. rotundifolia, but are about ⅜ inch across, and the petals and other parts of the flower are often more than 5 in number. The capsule is much larger, more enlarged near the top, which protrudes a little beyond the calyx, and is almost as long as the withered petals. Seeds similar to those in D. rotundifolia, but with a more loosely-reticulated seed-coat.

D. obovata (Mert.) is stated by Professor Babington to be

common in Scotland; it has the leaves with broader laminæ, and the styles often notched; but the chief difference is in the capsule, which is only about half as long as the sepals, and the seeds are always abortive. There can be little doubt but that it is a hybrid between D. rotundifolia and D. anglica, and if so it ought to be called D. rotundifolio-anglica. The only British specimen of it which has come under my notice is one in Mr. H. C. Watson's Herbarium, from "Glen Dee, Braemar," collected by Mr. Backhouse, and labelled "D. intermedia," which it certainly is not.

Larger Long-leaved Sundew, English Sundew.

French, *Rossolis à Longues Feuilles.* German, *Englischer Sonnenthau.*

SPECIES III.—DROSERA INTERMEDIA. *Hayne.*

PLATE CLXXXIV.

Reich. Ic. Fl. Germ. et Helv. Vol. III. *Cist.* Tab. XXIV. Fig. 4523.
D. longifolia, "*Linn.*" *Sm.* Eng. Bot. Tab. DCCCLXVIII. *Hook. & Arn.* Brit. Fl. ed. viii. p. 50. *Benth.* Handbook Brit. Fl. p. 234.

Leaves ascending, oblanceolate or obovate, gradually narrowed into long footstalks, which are glabrous. Scapes usually a little longer than the leafstalks, erect from a little way above the curved base. Capsule about as long as the sepals, pyriform. Seeds ovoid, with a rough compact testa fitting closely to the seed.

On wet heaths. Not uncommon in England, but very local in Scotland, where it occurs in Islay, Argyleshire; at Arishaig, Western Inverness-shire; and in the Lochar Moss, Dumfries.

England, Scotland, Ireland. Perennial. Summer and Autumn.

Very like D. anglica, but smaller; the leaves (including the leafstalks) being 1¼ to 2 inches long, and the scapes from 2 to 4 inches high. The leaves are broader in proportion, and less gradually narrowed into the footstalk. The scapes are always curved round at the base; they are usually more numerous than in D. anglica; and the plant often produces a short leafy stem, with the internodes slightly developed. The flowers are scarcely larger than those of D. rotundifolia. The styles (which are usually bipartite) have the branches slightly notched at the apex. The capsule is similar in shape to that of D. anglica, but shorter in proportion, only very slightly exceeding the sepals. The seeds are very different from those of the two other British species, as they have not the loose-fitting netted seed-coat which is so remarkable in them; they are much shorter and rounder, with small protuberances all over the surface: in general habit and colour it closely resembles them.

Lesser Long-leaved Sundew, Intermediate Sundew.

French, *Rossolis à Feuilles Ovales.* German, *Mittlerer Sonnenthau.*

ORDER X.—POLYGALACEÆ.

Herbs, undershrubs or shrubs, sometimes twining or climbing. Leaves alternate, rarely opposite or verticellate, generally sessile, simple, undivided, and often quite entire. Stipules none. Inflorescence terminal or axillary, consisting of racemes, spikes, or solitary flowers. Pedicels usually articulated at the base, each with a bract and 2 bracteoles. Flowers irregular. Sepals 5, persistent, imbricated, very unequal; the two innermost much larger than the others, petaloid. Petals 3 or 5, caducous, hypogynous; the lowest one, or keel, usually crested at the apex, concave, and often united to the two lateral ones; the two uppermost usually absent or reduced to small scales. Stamens 8, rarely 5 or 4, monodelphous, with the filaments united beyond the middle, the tube so formed cohering with the petals. Anthers often in two sets of 4 each, erect, commonly opening by an apical pore. Ovary free, 2-celled (rarely by abortion 1-celled, very rarely with 3 or 5 cells). Style simple, often incurved, somewhat petaloid, and divided into 2 lobes at the apex. Ovules usually 1 in each cell, pendulous and anatropous. Fruit a capsule, dehiscing loculicidally, or rarely septicidally, but sometimes indehiscent, when it is either dry or drupaceous. Seeds with a hard testa which is often hairy, generally with a lobed strophiole at the hilum. Albumen fleshy, sometimes none. Embryo nearly straight, central, with the radicle directed towards the hilum.

GENUS I.—POLYGALA. *Linn.*

Sepals with the superior and two outer inferior ones small; the two lateral (wings) much larger, at first petaloid, afterwards somewhat herbaceous. Lowest petal concave, bent up at the apex, which is commonly divided into a crest formed of small segments, more rarely only 3-lobed. Stamens 8, in a tube slit on the upper surface, united to the petals, and 2-lobed at the apex. Capsule obovate or oblong, notched at the apex, compressed at right angles to the partition and parallel to the calyx wings, dehiscing loculicidally. Seeds oblong, generally hairy, and crowned by a 3-lobed white strophiole.

Herbs, undershrubs, or shrubs, with flowers variable in colour, in racemes, spikes, or heads, which are terminal or lateral.

The generic name is derived from πολυ (*poly*), much, and γαλα (*gala*), milk, alluding to the reputed effects of the plant on the cattle that feed on it.

SPECIES I.—POLYGALA VULGARIS. *Linn.*

PLATES CLXXXV. CLXXXVI. CLXXXVII.

Rootstock producing numerous stems, and much branched, especially at the base. Leaves of the base of the stems ovate, those of the flowering shoots generally elliptical or lanceolate, becoming gradually longer than those below, which are not collected into a rosette at the base of the shoot. Calyx wings with the nerves rather conspicuous, the central nerve almost unbranched to near the apex, where it gives off branches which anastomose with the lateral nerves, which have numerous anastomosing branches on the outer side; or rarely the lateral veins anastomose directly with the central one. Strophiole of the seed with the lobes unequal, the lateral ones about one-third the length of the seed.

SUB-SPECIES I.—Polygala eu-vulgaris.

PLATES CLXXXV. CLXXXVI.

P. vulgaris, *Koch*, Syn. Fl. Germ. et Helv. p. 99.
P. vulgaris, var. α, *Bab.* Man. Brit. Bot. ed. v. p. 41. *Hook. & Arn.* Brit. Fl. ed. viii. p. 52.

Stems woody and procumbent at the base, and then usually ascending or erect, rather stiff, much branched near the base; the flowering shoots never umbellate. Leaves ascending, scattered throughout, but more crowded below; upper ones lanceolate. Racemes many-flowered, terminal. Central bract about as long as the pedicel when the flowers are fully expanded.

Var. α, *genuina.*

PLATE CLXXXV.

P. vulgaris, *Reich.* Ic. Fl. Germ. et Helv. Vol. XVIII. Tab. MCCCXLVI. Fig. 1.
P. vulgaris, *Gr. & Godr.* Fl. de Fr. Vol. I. p. 195.

Branches erect or ascending, straight. Racemes 10- to 20-flowered. Calyx wings oval-obovate, broader than the fruit. Pedicels glabrous. Margin of the bracts, calyx wings, petals, and capsule not ciliated.

Var. β, *grandiflora.*

"Upper leaves large, lanceolate. Calyx wings elliptical, apiculate, with lateral veins rejoining the mostly simple central vein

near its tip, and having many net-like veins externally. Flowers dark blue." (Bab. Man. Brit. Bot. ed. v. p. 41.)

Var. γ, *oxyptera.*

PLATE CLXXXVI.

P. oxyptera, *Reich.* Ic. Fl. Germ. et Helv. Vol. XVIII. Tab. MCCCXLVI. Fig. 2.

Branches ascending, slightly flexuous. Racemes 7- to 20-flowered. Calyx wings elliptical, wedge-shaped at the base, narrower and a little shorter than the capsule. Pedicels glabrous. Margins of the bracts, calyx wings, petals, and capsule not ciliated.

Var. δ, *ciliata.*

P. ciliata, Lebel, *Reich.* Ic. Fl. Germ. et Helv. Vol. XVIII. Tab. MCCCXLVI. Fig. 5. *Gr.* & *Godr.* Fl. de Fr. Vol. I. p. 195. *Brebisson,* Fl. de la Normandie, p. 43.

Branches prostrate, tortuous. Flowering shoots decumbent. Racemes 5- to 15-flowered. Calyx wings obovate, broader than the capsule. Upper part of the stem and pedicels pubescent. Margins of the bracts, calyx wings, crest of the corolla, and capsule ciliated.

Var. α, on chalky and sandy banks. Rather local but not unfrequent in England. Apparently rare in Scotland, as I only possess it from near Edinburgh; Dollar, Clackmannanshire; and Breadalbane, Perthshire. Var. β, on limestone rocks, Benbulben, Sligo. Var. γ, sandy places near the sea and dry pastures; Waterloo Sandhills, near Liverpool; Seacombe, Cheshire; Newhaven, Sussex; Cave Hill, co. Antrim; Meleaghs, co. Down; and the Channel Islands. Var. δ, on the chalk slopes of the old Roman road, on the Gogmagog Hills, Cambridgeshire.

England, Scotland, Ireland. Perennial. Late Spring, Summer.

Var. α has the rootstock woody, dividing into numerous branches so as to form large compact tufts. Stems branched at the base, but simple in the upper part, spreading out and ascending in all directions, 4 to 9 inches long, rather stiff, usually leafless at the very base, then with broadly ovate crowded leaves passing insensibly into elliptical and linear-lanceolate ones towards the top of the stem, which terminates in a raceme, at first conical and compact, with the flowers on both sides, but rather lax and secund when in fruit, and by that time it is often 2 or 3 inches long. Pedicels very short, with 3 caducous bracts at the base, of which the middle one is much the longest; but even that is shorter than the fruiting pedicel, though equal to the flowering ones. The three outer sepals of the calyx small, herbaceous, with coloured borders. The wings $\frac{1}{4}$ to $\frac{3}{8}$ inch long;

at first blue, rose colour, pink, or white, but becoming greenish after flowering; the veins usually darker, but not very prominent. Petals a very little longer than the wings, the lower one with a crest of narrow segments at the apex. Capsule shorter and a little narrower than the calyx wing, obovate, much compressed, surrounded by an herbaceous wing, which is notched at the apex, so that the general figure of the capsule appears obcordate. Seeds oblong-ovoid, blackish brown, with a white 3-lobed strophiole, of which the lateral lobes do not reach quite half-way down. Whole plant nearly glabrous except the stem, which is frequently slightly pubescent towards the top.

Var. β I have not seen.

Var. γ has the flowers considerably smaller, being from $\frac{3}{16}$ to $\frac{1}{4}$ inch long, the wings much narrower, and the capsule broader in proportion, much exceeding the width of the wing, and a little greater than its length when mature; the leaves are rather less crowded, and the stems less erect, branched higher up, and the growth more scrubby.

Var. δ is a much smaller plant, and might perhaps be considered as a distinct sub-species. The stems are much more tortuous, and spread out flat on the ground, only rising slightly at the apex. The flowers are $\frac{1}{4}$ inch long, with the wings extremely broad. The stem is thickly clothed with small curled hairs. The most distinctive mark, however, is the ciliation of the margins of the parts of the flower, especially of the calyx wings. The lower leaves are more spreading than in any of the other varieties, or are even slightly reflexed, and there is a more decided break in shape and size between the broad and the narrow leaves. In many respects it approaches P. depressa; but the stiffer and straighter stems in more compact tufts, and the racemes being always terminal, lead me to place it rather under eu-vulgaris. It is certainly the same as Dr. Lebel's plant, of which I possess specimens through the kindness of M. Lenormand. It has not, so far as I know, been noticed in this country until now.

Common Milkwort.

French, *Polygala Commun.* German, *Gemeine Kreuzblume.*

This common plant belongs to the same genus as the Snake-Root (Polygala Senega) of "Materia Medica," and possesses in some degree the same properties. The powdered root has been given in doses of half a drachm in pleurisy, and the infusion is said to have been used with advantage in coughs; for this purpose a decoction is recommended, made by boiling an ounce of the herb with a pint of water: it seems to act as an expectorant, but in larger doses is cathartic and emetic. The whole plant is extremely bitter. The old English names of this plant, according to Gerarde, are Cross-flower, Rogation-flower, and Milkwort, which latter name suggests the virtues ascribed to it as an assistant to wet-nursing. He says: "It is vulgarly known in Cheapside to the herbe women by the name of Hedge Hyssop, and sold to such as are ignorant for the same." Foreigners speak of it as a grateful and nutritious food for cattle. According to Swedish experiments, cows, sheep, and goats eat it, but swine refuse it.

Sub-Species II.—Polygala depressa. *Wenderoth.*

Plate CLXXXVII.

Reich. Ic. Fl. Germ. et Helv. Vol. XVIII. Tab. MCCCXLVII. Fig. 1.
P. serpyllacea, *Weihe*, Bot. Zeit. Vol. II. p. 745.
P. vulgaris, var. depressa, *Bab.* Man. Brit. Bot. ed. v. p. 41. *Hook. & Arn.* Brit. Fl. ed. viii. p. 52.

Stems filiform, weak, flexuous, procumbent, scarcely at all woody, branched, the flowering shoots sometimes arranged in an umbellate manner. Lower leaves nearly opposite, ovate, most of them spreading or reflexed, often sub-distichous; the upper ones elliptical, more distinctly alternate. Racemes 3- to 10-flowered, at first terminal, but the primary ones usually becoming lateral by the subsequent growth of an axillary branch which resembles a continuation of the main stem. Central bract shorter than the pedicel when the flowers are fully expanded.

On heaths and grassy places both dry and damp. Very common throughout the whole of Britain.

England, Scotland, Ireland. Perennial. Spring and Summer.

This is a much more slender plant than any of the forms placed under P. eu-vulgaris, with the stems 2 to 10 inches long, less numerous, less branched at the base, and not forming dense tufts; the lower leaves more spreading or divaricate, as well as nearly opposite, and all usually less crowded; the flowers earlier, fewer, smaller, and less distinctly secund in fruit. The colour is equally variable; dark or light blue, purple, pink, and white being all common colours. Some of the larger and stouter forms of P. depressa certainly closely resemble the smaller examples of P. eu-vulgaris, especially the var. oxyptera; but, on the whole, there is usually little difficulty in recognizing the plant, which is by far the most common Milkwort in Britain.

Lesser Common Milkwort.

Species II.—POLYGALA CALCAREA. *F. Schultz.*

Plate CLXXXVIII.

Reich. Ic. Fl. Germ. et Helv. Vol. XVIII. Tab. MCCCXLIX. Fig. 1.
P. amara, *D. Don*, Eng. Bot. Sup. No. 2764.
P. vulgaris, var. β, *Hook. & Arn.* Brit. Fl. ed. viii. p. 52.

Rootstock producing numerous branches terminating in short leafy stems; some of them barren, others having rather large obovate crowded leaves forming an imperfect rosette, from which arise

several diverging flowering shoots with elliptical leaves, which become abruptly much smaller and narrower than those below them. Central bract longer than the pedicel when the flower is fully expanded. Calyx wings very broadly obovate, as broad as the fruit and longer than it, with the central nerve distinct, giving off a little beyond the middle a branch, which generally anastomoses with the very faint lateral nerves; the latter with numerous free branches on the outside (these last seldom anastomose). Strophiole of the seed with the lobes unequal, the lateral ones nearly half the length of the seed.

On chalky débris. Local. Abundant about Cuxton and Boxley, Kent; Blandford, Dorset; Reigate Hills and Hogsback, Surrey; Pangbourne, Berkshire; Cotswold Hills, Gloucester; and also reported from Wiltshire.

England. Perennial. Summer.

Plant growing in lax, straggling tufts, with slender wiry procumbent flexuous stems, 2 to 6 inches long in the larger examples; the stems are leafless at the base, but clothed with broadly oval-obovate leaves about $\frac{1}{2}$ inch long for the last inch or so of each primary stem, from the apex of which (in those stems which flower) 1 to 6 ascending flowering shoots with narrowly lanceolate or elliptical leaves are produced, and thus appear to rise from a stalked rosette. Flowers bright blue, pink, or white, about $\frac{1}{4}$ inch long, in short blunt compact terminal racemes of 6 to 12 flowers, becoming more lax in fruit. Sepals very broadly ovate, suddenly contracted towards the base so as to be almost spathulate, about as broad as the capsule and considerably longer, with the central vein alone conspicuous, and frequently the anastomosis between its branches and the lateral veins is not complete. Capsule inversely deltoid-roundish, suddenly narrowed towards the base, surrounded by a very broad wing, which has a small notch at the apex. Seeds oblong-ovoid, with the lateral lobes of the strophiole reaching half-way down, and consequently longer than those of P. vulgaris. Plant deep shining green, glabrous.

This appears to have no connecting links with any of the forms of P. vulgaris, none of which have the flowering shoots proceeding from the axils of the leaves of a rosette, as in the present species. Late in the summer the leaves of the rosette usually decay, but the umbellate arrangement of the flowering shoots still remains, and is more distinct than in the forms of P. depressa, in which it sometimes occurs. The branches of the rootstock are much less distinctly woody than in P. eu-vulgaris, and in this respect approach P. depressa; but in that form the stems do not grow in compact tufts or cushions. The flowers of this plant are usually in shorter and more ovoid racemes,

and more of them are expanded at one time, so that it is decidedly the handsomest of the British Polygalæ. This plant has not the bitter taste of the following species, with which it appears to have little in common.

Chalk Milkwort.

German, *Kalk-Kreuzblume.*

SPECIES III.—POLYGALA AUSTRIACA. *Crantz.*

PLATE CLXXXIX.

Reich. Ic. Fl. Germ. et Helv. Vol. XVIII. Tab. MCCCXLVIII. Fig. 182.
P. uliginosa, *Reich.* "olim." *Fries*, Sum. Veg. Scand. p. 32.

Rootstock simple or slightly branched, producing close to the crown a rosette of large obovate leaves, from which one or more erect flowering shoots arise, having the leaves abruptly becoming smaller and narrower than those of the rosette. Calyx wings elliptical, much narrower and a little shorter than the fruit, with all the three nerves very prominent and nearly simple, never anastomosing. "Helmet of the stigma acute, serrulated" (Reich.). Lobes of the strophiole nearly equal, one-fourth the length of the seed.

Var. α, *genuina.*

Capsule rounded at the base. Flowers white.

Var. β, *uliginosa.*

Capsule wedge-shaped at the base. Flowers purplish or bluish.

In damp places. Very rare. Var. β discovered by Messrs. Backhouse, in 1852, on the banks of the eastern fork of the streamlet which forms the White Force, Teesdale, Yorkshire; and more recently on one of the sugar limestone hillocks of Cronkley plateau, near the former station. Var. α not known to occur in Britain.

England. Perennial. Summer and Autumn.

An extremely small plant, the British specimens that have come under my notice not being above 1 or 2 inches high, though on the Continent it sometimes attains the height of 4 inches. It has the mode of growth of P. calcarea; but the large obovate crowded leaves which form the rosette are close to the point where the rootstock commences to branch (when it does so, for it often produces but one), instead of at the end of the primary branches. The flowers are

much smaller, about $\frac{1}{5}$ inch long, with the wings as narrow as those of P. eu-vulgaris, var. oxyptera, and the nerves of the wings are also more strongly marked than in any of the other British forms. The central nerve is unbranched, the lateral ones with a few free veins on the outer side. In the station where it was first discovered the flowers are purplish pink; in the second, from which I have not seen specimens, Mr. Baker informs me that they are blue. The taste of this plant is bitter, as in the Continental P. amara, if, indeed, that plant be distinct from P. austriaca. According to Reichenbach, P. amara differs by its larger flowers with the corolla longer than the wings, and the style with blunt nearly entire lobes. I have not seen specimens of Reichenbach's plant, and there seems to be much confusion about the name P. amara, which has been applied to P. calcarea, P. austriaca, &c.

It is certainly difficult to settle the limits of the species in this genus, from the great difficulty of cultivating them, and so testing the permanence of the forms. Many of the differences may be only those dependent on growing in special situations; as, for instance, the form I have made a variety, "ciliata," of P. eu-vulgaris, is usually regarded as a species; but when we consider the extreme dryness of the places where it grows, and also that dryness would tend to produce those very characters which are relied on for distinguishing it from P. vulgaris, is it not probable that in this instance the special habitat has produced the difference? and it may be the same in other cases.

Mr. Bentham considers all the British Polygalæ belong to one species, to which he gives the name of P. vulgaris.

Small Bitter Milkwort.

French, *Polygala d'Autriche.*

ORDER XI.—FRANKENIACEÆ.

Small branched undershrubs or herbs with jointed stems and small opposite or verticellate leaves, often with revolute edges, and frequently fasciculate leaves in the axils of the primary ones. Stipules none. Flowers rose-colour, flesh-colour, or purple, regular, perfect, sessile in the forks of the branches or on the termination of short leafy shoots, frequently arranged so as to form a dense leafy terminal cyme. Calyx persistent, with the sepals united into a tube 4- or 6-toothed at the apex. Petals 4 to 6, hypogynous, free, with a long membrane-bordered claw and spreading lamina.

Stamens usually 6 (sometimes 4, 5, or even more), hypogynous; the filaments broad, subulate, free, or united at the base into an extremely short ring; anthers versatile, 2-celled, dehiscing longitudinally. Ovary free, sessile, 1-celled, with 3 (sometimes 2 or 4) parietal placentæ. Style filiform, divided at the apex into as many branches as there are placentæ; stigmas on the inside of the branches. Ovules indefinite, sub-anatropous, with a long funiculus. Capsule included within the persistent calyx, 1-celled, dehiscing loculicidally into as many valves as there are placentæ. Seeds ovoid or oblong-ovoid, with a hard rough testa. Embryo in the axis of farinaceous albumen, with the radicle near the hilum.

GENUS I.—FRANKENIA. *Linn.*

The only genus. Character the same as that of the Order.

Small maritime plants, with heath-like leaves, and flowers resembling those of a small pink. Stems and leaves often reddish.

This genus was named in honour of John Frankenius, Professor of Botany at Upsal, who first enumerated the plants of Sweden in "Speculum Botanicon," 1638.

SPECIES I.—FRANKENIA LÆVIS. *Linn.*

PLATE CXC.

Stem prostrate, diffusely branched. Leaves sub-cylindrical, with the edges revolute. Plant glabrous (or the stem finely hairy), with the leaves ciliated at the base. Flowers solitary, from the forks of the stem, or in the axils of the leaves; more rarely terminal.

In salt marshes, by the sides of brackish ditches and on chalk cliffs. Not uncommon in the South-East of England, where it occurs in the counties of Hants, Sussex, Kent, Essex, Suffolk, and Norfolk. It was formerly found near Wisbech, in Cambridgeshire; and it has also been found in the county of Durham, but only on ballast-hills.

England. Perennial (almost a shrub). Summer and Autumn.

Rootstock woody, dividing into numerous stems, which are prostrate, much branched, wiry, almost woody, 3 inches to 2 feet long, thickly clothed towards the extremity of the branches with leaves, which are in opposite pairs, or in whorls of 4, sessile, with dilated connate bases, and fascicles of secondary leaves or short leafy branches in the axils. Leaves oblong (but the two sides are so much rolled back, that the shape of the leaf becomes narrowly cylindrical), flattened above, $\frac{3}{16}$ to $\frac{1}{4}$ inch long. Flowers sessile,

about ¼ inch across, in the forks of the stem and on the termination of extremely short axillary branches, more rarely terminating the elongated branches. Calyx about ⅛ inch long, somewhat fleshy, with erect narrow acute teeth at the apex, and as many prominent ribs towards the base. Petals with a long erect claw, having a lanceolate yellowish scale attached to it; lamina wedgeshaped-obovate, faintly crenated at the obtuse apex, rose-colour. Stamens generally 6, three longer than the others, with the filaments flat, and gradually dilated towards the base. Capsule conical, 3-sided, with a furrow down each of the sides, completely concealed in the tube of the calyx, surrounded by the persistent filaments. Whole plant deep green, very slightly glaucous, and usually more or less tinged with brownish red; stem generally clothed with minute curled hairs, except towards the base; sheaths formed by the dilated bases of the leaves, with rather long white ciliæ (a few of these are also found along the margins of the leaves above this point); leaves somewhat fleshy.

Smooth Sea-Heath.

French, *Frankénie Lisse.*

EXCLUDED SPECIES.

FRANKENIA PULVERULENTA. *Linn.*

E. B. (ed. i.) No. 2222.

This Mediterranean plant is stated to have been found in the time of Dillenius; and Hudson declares that he himself gathered it between Bognor and Brighton. Since then there has been no account of its occurrence, and it certainly does not now grow on the Sussex coast; most probably there was some error respecting it.

ORDER XII.—CARYOPHYLLACEÆ.

Herbs, or sometimes undershrubs, with the stems thickened and articulated at the nodes. Leaves entire, opposite or rarely verticellate, generally connate at the base. Stipules none, or if present small and scarious. Inflorescence commonly a dichotomous cyme, more rarely in the form of a false raceme, panicle, umbel, or solitary flower. Flowers perfect (or rarely unisexual), regular. Calyx persistent, of 5 or 4 imbricated sepals, free or united into a tube.

Petals as many as the sepals, inserted on a hypogynous ring (or more rarely perigynous), imbricated, occasionally abortive or absent. Stamens 10 or 5 (more rarely 8 or 4 or fewer), hypogynous or more or less perigynous; anthers 2-celled. Torus usually small, but in some Silenes and Lychnides lengthened into a gynophore, so that the petals, stamens, and ovary are stalked within the calyx; while in some Alsineæ and Polycarpeæ it is frequently expanded into an annular disk slightly adhering to the calyx. Ovary free, 1-celled, sometimes imperfectly 2- to 5-celled at the base. Styles 2 to 5, free or more or less united, stigmatiferous within at the upper part, or rarely from the base. Placentæ at the base of the ovary or on a central columella. Ovules indefinite, amphitropous. Capsule dry, very rarely a berry, opening by as many valves or teeth as there are styles (or twice as many), rarely indehiscent or splitting transversely. Seeds generally numerous, with a hard or membranous testa. Albumen farinaceous. Embryo more or less curved, excentrical or peripherical; cotyledons narrow; radicle generally pointing to the hilum.

Sub-Order I.—SILENEÆ.

Sepals united into a tube, which is 4- or 5-toothed or -lobed at the apex. Petals, stamens, and ovary usually stipitate within the calyx tube. Stipules none.

GENUS I.—DIANTHUS. *Linn.*

Flowers surrounded by involucral scales enveloping the base of the calyx. Calyx sub-cylindrical, or rarely bluntly pentagonal, 5-toothed at the apex, without nerves indicating the line of demarcation between the sepals, which have generally numerous close equal parallel nerves; more rarely 3 down the centre of each sepal. Petals 5, the spreading laminæ generally abruptly attenuated into long slender claws, which are generally furnished with longitudinal bands, and all parallel to each other; more rarely the laminæ gradually narrowed into the diverging claws; the margins of the laminæ generally more or less toothed or jagged, without scales where they meet the claws. Stamens 10. Torus more or less elongated into a very short stalk-like gynophore between the calyx and the other parts of the flower. Styles 2. Capsule elongate- or cylindrical-ovoid, opening at the apex by 4 teeth, without imperfect partitions. Seeds black, shagreened, peltate, orbicular, apiculate, convex above,

flat or slightly concave beneath, with the hilum about the middle of the flat or concave base.

Herbs or undershrubs, with the leaves often grass-like and glaucous. Flowers solitary, or in cymes or fascicles, generally rose-coloured or purple.

The name of this genus of plants is derived from ἆιος (*ilios*), divine, and ἄνθος (*anthos*), a flower—the flower of the gods,—in allusion to the singular beauty and fragrance of some of the species. It is from one or other of the species of this genus that the cultivated varieties of Carnations and Pinks are produced.

Sub-Genus I.—CARYOPHYLLUM. *Endl.*

Calyx sub-cylindrical, not angular, covered all over with nerves, each sepal having 7, 9, or 11; involucral bracts or scales 2 or more, embracing the base of the calyx, present in all the flowers. Flowers in fasciculate or lax cymes, or solitary. Petals suddenly contracted into narrow claws parallel to each other.

SPECIES I.—DIANTHUS ARMERIA.

Plate CXCI.

Reich. Ic. Fl. Germ. et Helv. Vol. VI. *Caryoph.* Tab. CCXLIX. Fig. 5011.

No perennial rootstock nor barren leafy shoots. Stems 1 or more from the crown of the root, slightly dichotomously branched above, each fork terminating in a small fascicle of shortly-stalked flowers. Calyx woolly, strongly ribbed, with 2 involucral bracts, which are oval, acuminated into long acute points, nearly equalling or sometimes exceeding the narrowly-triangular calyx teeth. Petals with the laminæ elliptical-oblong, toothed at the apex, not contiguous.

On dry banks and in fields. Rather rare, though pretty generally distributed in the South and East of England. Reported from Forfarshire; but Dr. Walker Arnott considers it probably introduced.

England, Scotland?. Annual or Biennial. Summer and Autumn.

Root a tap-root, at first producing a rosette of linear-oblanceolate leaves, from the centre of which an erect stem, 1 to 2 feet high, is sent up, irregularly forked in the upper portion: in large examples the stem branches into several at the base, and these lateral stems are first curved, then erect. Stem leaves ascending-erect, linear-strapshaped, acute, keeled, 1½ to 2 inches long. Stem and branches terminated by small compact fascicles of 3 to 8 flowers with long linear-lanceolate acute bracts. Fascicles of flowers dichotomous, with or without a flower in the forks. Calyx tube with

short woolly hairs, numerous close prominent ribs, and terminated by 5 narrowly-lanceolate acute teeth. Involucral scales ribbed like the calyx, rather suddenly narrowed into long awn-like points, which usually equal or even exceed the calyx. Flowers $\frac{3}{4}$ inch long, $\frac{3}{8}$ inch across, with the laminæ of the petals narrow, with shallow teeth at the apex, not contiguous, bright red with pale dots, and usually a darker transverse line at the base, scentless. Styles stigmatiferous nearly to the base. Capsule sub-cylindrical, opening by 5 short teeth, containing numerous small seeds which are roundish in outline with a projecting point at one side, convex above, concave beneath, where there is a prominent transverse line in the middle of which is the hilum by which they are attached to the seedstalk; the whole of the surface covered with raised points. Plant dark green, not glaucous, with short hairs on the leaves and upper part of the stem, and sometimes also on the lower part.

Deptford Pink.

French, *Œillet Velu.* German, *Rauhe Nelke.*

This pretty little flower reminds us of the "Sweet William" which decks our gardens, and perfumes the air with its fragrance.

SPECIES II.—DIANTHUS DELTOIDES. *Linn.*

PLATE CXCII.

Reich. Ic. Fl. Germ. et Helv. Vol. VI. *Caryoph.* Tab. CCLXIII. Fig. 5040.

Rootstock perennial, with numerous slender scarcely woody divisions, producing procumbent nearly simple often elongated barren shoots, and erect or ascending flowering stems slightly dichotomously branched in the upper part, each fork terminating in a single flower, or more rarely two or three together. Leaves of the barren shoots oblanceolate-strapshaped, rather blunt, those of the flowering stems lanceolate-strapshaped, the upper ones very acute. Calyx glabrous, rather strongly ribbed with 2 (rarely 4) involucral bracts, which are broadly-oval, abruptly acuminated into a triangular acute point, which reaches about half the distance to the apex of the triangular acute calyx teeth. Petals with the laminæ wedgeshaped-obovate, rounded and toothed at the apex, not contiguous.

Var. *α, genuina.*

Involucral scales generally 2. Flowers purplish rose-colour. Plant slightly glaucous.

Var. *β, glaucus.*

Dianthus glaucus, *Linn.* Sp. Pl. p. 588.

Involucral scales generally 4. Flowers white. Plant decidedly glaucous.

On dry pastures. Var. α rather local, but occurring in most of the counties on the East side of Britain, as far North as Moray; less abundant on the West side of the island. Var. β a doubtful native, although it has been reported from the Queen's Park, Edinburgh, also from Yorkshire and Surrey.

England, Scotland, Ireland ?. Perennial. Late Summer and Autumn.

Cæspitose. Rootstock dividing into very slender wiry branches, producing numerous barren shoots with leaves $\frac{1}{2}$ to $\frac{3}{4}$ inch long, having a strong prominent rib beneath. Flowering stems decumbent at the base, then more or less erect, with the leaves distant or approximate, becoming narrower and more acute towards the top of the stem. Flowers 1 to 6 on each stem, arranged in an irregularly dichotomous paniculate cyme. Peduncles usually about as long as the calyx. Flowers $\frac{5}{8}$ inch long, $\frac{3}{4}$ inch across. Involucral scales and calyx teeth with membranous margins, the mucro of the former and the calyx tube with rough green ribs. Petals varying in the depth of the rose-colour, with a few white spots, and a vandyked crimson band at the base (the latter is present even in the white variety), rounded at the apex, where there are narrowly triangular irregular teeth, not extending above one-fifth the length of the laminæ of the petal. Capsule cylindrical. Seeds depressed, obovate, shagreened, slightly convex on the upper and concave on the under surfaces; on the latter there is a raised line, having the hilum about the middle. Plant growing in lax tufts, generally only slightly glaucous; stem and margins of the leaves and sometimes the surfaces of the latter slightly pubescent, with curved hairs.

Maiden Pink.

French, *Œillet Deltoïde.* German, *Deltablumige Nelke.*

From this species are derived but few of the varieties which adorn our gardens, and which are so beautiful as to have given rise to an expression denoting pre-eminence in excellence. Shakespeare speaks of the "very Pink of courtesy;" Young, of the "Pink of puppies." In some parts of Hungary this plant is dried in the sun and steeped in wine, and is considered good as a cure for the ague. We find an old English name for it is "Sop-in-Wine," which suggests a similar practice. Gerarde says: "There is a wild creeping Pink which groweth in our pastures neere about London and in other places, but especially in the great field next to Detford by the path side as you go from Redriffe to Greenewich, which hath many small tender leaves shorter than any other of the wilde Pinkes, set upon little tender stalks, which lie flat upon the ground, taking hold of the same in sundry places, whereby it greatly increaseth, whereupon grow little reddish floures. The root is small, tough, and long lasting."

SPECIES III.—DIANTHUS CÆSIUS. *Linn.*

PLATE CXCIII.

Reich. Ic. Fl. Germ. et Helv. Vol. VI. *Caryoph.* Tab. CCLXV. Fig. 5044.

Rootstock perennial, with numerous rather slender slightly woody divisions, producing ascending simple barren shoots and erect unbranched flowering stems. Leaves of the barren shoots strapshaped-linear, rather obtuse, those of the flowering stems oblanceolate-linear, and blunt near the base of the stem, but linear-acute in its upper portion; all 3-nerved and with scabrous margins. Flowers solitary, usually only 1 on the stem. Calyx glabrous, very indistinctly ribbed, with 4 involucral bracts, which are roundish obovate, abruptly acuminated into a very short acute point, which reaches about one-fourth the distance to the apex of the broadly triangular rather blunt calyx teeth. Petals with the laminæ inversely deltoid, rather truncate and toothed at the apex, nearly contiguous.

On rocks. Very rare. On the abrupt limestone precipices of Cheddar Rocks, Somersetshire.

England. Perennial. Late Summer.

Cæspitose. Rootstock with long slender divisions, producing short barren tufts with narrow leaves 1½ to 2 inches long; flowering stems with the leaves shorter. The upper leaves have the lateral nerves at the margin, the lower ones a little way from it. Involucral bracts membranous, with the point herbaceous. Flowers generally only 1 on each stem, more rarely 2, ¾ inch long, 1 inch across, with the calyx tinged with purplish red, cylindrical, thick in proportion to its length. "Flowers delightfully fragrant, of a delicate pale rose-colour" (Smith). Petals with the laminæ irregularly toothed at the apex, the teeth not extending beyond one-sixth or one-eighth the length of the laminæ, more or less hairy at the base. Plant growing in tufts, glaucous and glabrous, with the leaves rough at the margins.

Cheddar Pink, Mountain Pink.

French, *Œillet Bleuâtre.* German, *Graugrüne Nelke.*

This species is worthy of being cultivated on ornamental rock-work, and is very easily propagated. When introduced into the crevice of a wall, it makes a beautiful appearance with its pretty blossoms.

SPECIES IV.—DIANTHUS CARYOPHYLLUS. *Linn.*

PLATE CXCIV.

Reich. Ic. Fl. Germ. et Helv. Vol. VI. *Caryoph.* Tab. CCLXVIII. Fig. 5051.

Rootstock perennial, branched, woody, producing barren shoots and ascending flowering stems. Leaves of the barren shoots and base of the stem elongate-linear, those of the flowering stems shorter; all acute, 1-nerved, with smooth margins. Flowers solitary, in a lax irregular paniculate cyme. Calyx glabrous, obsoletely ribbed, with 4 involucral bracts, which are sub-rhomboidal, abruptly acuminated into a very short cuspidate point which reaches about one-fourth the distance to the apex of the triangular rather acute calyx teeth. Petals with the laminæ deltoid-roundish, truncate and toothed at the apex, contiguous.

On old castles and the adjacent rocks. Not indigenous, but occurs on Rochester Castle in Kent, and probably on other similar buildings.

[England.] Perennial. Late Summer.

Rootstock decidedly woody, and in old plants often $\frac{1}{4}$ inch thick, producing stems decumbent at the base, then ascending, more or less bent at each point, 1 to 2 feet high. Leaves ascending, recurved, grass-like, the lower ones (or those of the barren shoots) 4 to 6 inches long. Flowers $1\frac{1}{4}$ inch long, $1\frac{1}{2}$ inch across, very fragrant. Calyx cylindrical, contracted at the mouth, $\frac{3}{8}$ inch in diameter, very closely and indistinctly ribbed at the base, rather more distinctly so at the apex (as in D. cæsius), green. Involucral scales membranous, with the point herbaceous. Petals bright rose-colour, irregularly toothed at the apex, the teeth not extending one-fourth the length of the lamina, and often not above one-eighth. Capsule ovoid. Seeds shagreened, depressed-obovate, nearly flat. Plant quite glabrous and glaucous, growing in loose straggling tufts.

This plant has the flowers dimorphous, some having the stamens extremely short, and others on the same individual as long as or longer than the claws of the petals. The dimorphism also occurs in D. plumarius, where it is also a monœcious dimorphism; in D. barbatus it is a dicœcious dimorphism; in D. deltoides and Armeria the flowers appear to be all alike; but beyond these I have had no opportunity of observing the flowers of the Pinks in a living state.

Clove Pink, Wild Carnation.

French, *Œillet Giroflée.*

From this species are derived all the beautiful varieties of our garden Carnations and Picotees. The Carnation seems to have been unknown to the ancients, at least in

its cultivated state, for we have no mention of it by any of the Roman poets. It has, however, been cultivated from time immemorial in Europe, and is now in as great favour as ever for its beauty and rich spicy odour. In Germany and Italy it is the principal florist's flower, and from these countries the British florists procure their most esteemed varieties. At the beginning of the eighteenth century there were four hundred varieties in cultivation, and we scarcely think they have diminished. They are arranged in three classes:—Flakes, Bizarres, and Picotees. Flakes have two colours only, and their stripes large, quite through the petals of the flower. Bizarres are regularly spotted or striped with not less than three colours. Picotees have a white ground edged or pounced with scarlet, red, purple, or other colours. We all know the labour and expense that is bestowed in order to obtain a perfect double Carnation; and we know of scarcely any flower that by its delicious perfume as well as its own beauty so well rewards the care of the cultivator. The flowers of this species of Dianthus were formerly employed in medicine. The old physicians considered them cordial, and administered the infusion in pestilential fevers and nervous complaints; but though somewhat aromatic, the flowers possess no great medical virtues, and have long been discarded by our practitioners as a remedy, though still used as a colouring material, and retained as such until now in the Dublin Pharmacopœia. What the revolutions of the new British Pharmacopœia may be as to many of these old ingredients in pharmacy we cannot at present say. Old Gerarde, with a wisdom superior to his age, says: "These are not used in physicke, but esteemed for their use in garlands and nosegaies. They are good to be put into vinegar, to give it a pleasant taste and gallant colour."

SPECIES V.—DIANTHUS PLUMARIUS. *Linn.*

PLATE CXCV.

Reich. Ic. Fl. Germ. et Helv. Vol. IV. *Caryoph.* Tab. CCLVII. Fig. 5030.

Rootstock perennial, branched, woody, producing barren shoots and ascending flowering stems. Leaves of the barren shoots and base of the stem elongate-linear, those of the flowering ones shorter; all acute, 1-nerved, with scabrous margins. Flowers solitary, in a lax irregular paniculate cyme. Calyx glabrous, obsoletely ribbed at the base, distinctly so at the apex, with 4 involucral bracts, which are rhomboidal-roundish, abruptly acuminated into a very short cuspidate point, which reaches about one-third the distance to the apex of the oblong-triangular blunt calyx teeth. Petals with the laminæ inversely-deltoid, obovate, rounded and fimbriated at the apex, scarcely contiguous.

On old walls. Not native, but naturalized in a good many places:— at Shalford, Surrey; East Ham, Essex; Haughmond Abbey, Shropshire; Conway Castle, Wales.

England. Perennial. Summer.

Very like D. caryophyllus, but usually smaller, seldom exceeding 1 foot in height, with the leaves narrower, less recurved, and having

the margins ciliated with short spinous points. Flowers rather smaller, generally paler and more purple, with the laminæ of the petals hairy at the base, and at the apex cut into long slender tapering strips reaching one-half or one-third the distance to the base; the plant is also much more densely cæspitose in its mode of growth.

Common Pink.

French, *Œillet Mignardise.*

This species is the origin of all the plants commonly cultivated in gardens under the name of Pheasant's-eye Pinks, White Pinks, &c.

Sub-Genus II.—KOHLRAUSCHIA. *Kunth.*

Calyx sub-cylindrical, somewhat pentagonal at the apex, nerved at intervals, each sepal having 3 down its centre, the spaces between the nerves being membranous. Involucral bracts 1 to each flower (except the central flower, which has none), longer than the calyx, and completely enveloping it. Flowers in a head closely wrapped in large membranous bracts. Petals suddenly contracted into narrow claws parallel to each other.

SPECIES VI.—DIANTHUS PROLIFER. *Linn.*

Plate CXCVI.

Kohlrauschia prolifera, *Kunth. Reich.* Ic. Fl. Germ. et Helv. Vol. VI. Tab. CCXLVII. Fig. 5009.

No perennial rootstock or barren leafy shoots. Stems 1 or more from the crown of the root, simple or slightly branched above, each fork terminating in a small ovate-fusiform head of flowers surrounded by a general involucre of sub-membranous bracts, of which the inner obtuse ones are twice as long as the exterior mucronate pair. Involucral bract of each of the separate flowers as long as the calyx, oval-obtuse. Calyx glabrous, with 3 rather faint ribs in the centre of each sepal, which terminates in a rounded membranous tooth. Petals with the laminæ obovate-emarginate, not toothed, contiguous. Seeds shagreened, but without acute tubercles. Plant glabrous.

In gravelly and sandy places. Very rare. Near Ryde, in the Isle of Wight; but the station is said to be now destroyed by building. It has also occurred near Windsor and Norwich, and in Sussex. Common in the South-west of Jersey.

England. Annual. Summer and Autumn.

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Root a tap-root, producing 1 or more erect slender stems 3 inches to 2 feet high, with ascending branches in the upper part in large examples. Leaves short, ½ to ¾ inch long, lanceolate-linear, scabrous, with minute prickles at the margins. Heads of flowers about ¾ inch long, enclosed in about 6 pale yellowish-olive scales of the consistence of parchment, which enclose from 1 to 11 flowers, each flower except the central one completely rolled up in a scale* similar to those just mentioned. Calyx very long and slender, membranous at the top and along the line of junction of the sepals. Flowers about ¼ to ⅜ inch across, pale purplish-red, only one opening in each head at a time. Capsule ovoid-fusiform, rupturing the calyx as it increases in size. Seeds blackish, obovate, nearly flat above and concave below, with the edges incurved and the hilum in the centre. Plant slightly glaucous, glabrous.

Proliferous Pink, Childing Pink, Limewort.

French, *Œillet Prolifère.* German, *Sprössende Felsnelke.*

GENUS II.—SAPONARIA. *Linn.*

Flowers without involucral scales at the base of the calyx. Calyx sub-cylindrical, 5-toothed at the apex, without prominent nerves to indicate the line of demarcation between the sepals, each of which has from 3 to 5 nerves. Petals 5, with long claws (which are usually furnished with raised longitudinal bands) and spreading laminæ, generally with small scales at the base forming a crown. Stamens 10. Torus usually more or less elongated into a very short stalk-like gynophore between the calyx and other parts of the flower. Styles 2. Capsule oblong-ovoid, without partitions, or sometimes with 2 rudimentary ones, opening at the apex by 4 teeth or short valves. Seeds reniform, tuberculated, laterally compressed, having the hilum on one of the margins. Embryo peripherical, forming nearly a circle.

Annual or perennial herbs, with lilac, red, or yellowish flowers, in dichotomous paniculate or fasciculate cymes.

The name of this genus comes from *sapo*, soap; so called because the bruised leaves are said to produce a lather like soap when agitated in water.

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* Some authors describe the calyx as wrapped in two scales; but in all the specimens which I have had an opportunity of dissecting I have been able to find only one.

SPECIES I.—SAPONARIA OFFICINALIS. *Linn.*

PLATE CXCVII.

Reich. Ic. Fl. Germ. et Helv. Vol. VI. *Caryoph.* Tab. CCXLV. Fig. 4995.

Rootstock creeping. Stems erect. Leaves oval or elliptical, 3-nerved. Flowers in small corymbose cymes, united into a panicle. Calyx glabrous. Petals with 2 small scales at the throat.

On the borders of woods and hedges and by roadsides. Not uncommon; but probably escaped from cultivation in many localities, though apparently native on the coasts of Devon and Cornwall and in North Wales.

England, [Scotland,] Ireland ?. Perennial. Autumn.

Rootstock thick, white, fleshy, extensively creeping and emitting long stolons and erect flowering stems; the latter branched in the upper part, from 1½ to 3 feet high, sometimes decumbent at the base. Leaves 2 to 4 inches long, varying from broadly oval to elliptical, decreasing in size and breadth upwards; all with 3 nerves, and the lowest sometimes with 2 additional nerves at the base. Flowers 1 inch long by 1 inch across, in a compact terminal corymbose cyme, and other lateral cymes with fewer flowers from the axils of the upper leaves. Calyx tube generally tinged with red, sub-cylindrical, umbilicate at the base, with 5 short triangular teeth at the apex, indistinctly ribbed; becoming fusiform as the capsule increases in size. Petals with the claw 4-angled, longer than the calyx tube; the laminæ wedgeshaped-obovate, entire or slightly emarginate, not contiguous, pale lilac, flesh-coloured, or nearly white. Capsule often abortive, oblong-ovoid, supported upon a short thick gynophore. Seeds roundish-reniform, slightly compressed, covered with small points, with the hilum in the middle of the inner margin. Plant quite glabrous; leaves very slightly glaucous, soapy to the touch.

The flowers of this species are very often double, which always attaches a suspicion that such plants are of garden origin. A curious variety, or rather monstrosity (S. hybrida, Linn.), has been found in Northamptonshire and on the sand-hills to the North of Liverpool, which has some of the upper leaves connate, and the corolla monopetalous.

Common Soapwort, Bruisewort, Fuller's Herb.

French, *Saponaire Officinale.* German, *Gebräuchliches Seifenkraut.*

When boiled or bruised in water the leaves of this plant become saponaceous, and were used in ancient times as a substitute for soap; especially, it is said, by the mendicant friars. The lather so formed has all the effects of soap, and readily removes grease. Not being affected by acids, it might be usefully employed when the water is hard. The decoction has been employed both in France and Germany as an external

application to the itch. It has also been given internally in gout, rheumatism, and some other disorders. Boerhaave recommended it for jaundice; but there is no proof of its efficacy. It contains a peculiar principle called saponine, which is white, amorphous, and has a taste first sweet, then styptic, and finally acrid (Gregory). It is a powerful sternutatory, and is soluble in water. The solution froths when agitated, like soap. When acted on by alkalies, saponine is converted into saponic acid. The detergent properties of the plant appear to depend on this substance.

GENUS III.—CUCUBALUS. *Gærtn.*

Flowers without scales at the base. Calyx inflated, globose, cup-shaped or almost bell-shaped, at length nearly rotate, 5-toothed, 10-nerved, five of these indicating the line of demarcation between the sepals. Petals 5, with a narrow claw without raised longitudinal bands, and a spreading obovate bifid lamina with 2 small adnate scales at the base of each. Stamens 10. Torus elongated into a stalk-like gynophore between the calyx and the other parts of the flower. Styles 3, rarely 2. Capsule globose, resembling a berry, with 3 imperfect partitions; becoming dry when mature. Seeds reniform-roundish, shining, with a lateral hilum. Embryo peripherical, forming not quite a circle.

A genus containing only one known species, which differs from all the other Caryophyllaceæ by having a fleshy fruit.

The generic name Cucubalus is altered from *cacobolus*, a word derived from κακος (*kakos*), bad, and βολη (*bole*), a shoot or sprig; that is to say, a bad plant, a weed,—one destructive of the soil.

SPECIES I.—CUCUBALUS BACCIFERUS. *Linn.*

PLATE CXCVIII.

C. baccifer, *Gærtn.* *Reich.* Ic. Fl. Germ. et Helv. Vol. VI. *Caryoph.* Tab. CCCII. Fig. 8122.
C. baccifer, *Gærtn.* *Sm.* Eng. Bot. No. 1577.

Stem diffusely branched. Leaves ovate, acuminated both at the base and apex. Petals not contiguous, with the two lobes of the laminæ parallel.

On the banks of the ditch on the left-hand side of the road from Blackwall to the Ferry House, Isle of Dogs, but almost certainly introduced.

[England]. Perennial. Summer.

Rootstock creeping. Stems very brittle, diffusely branched, 2 to 3 feet long; branches terminating in very lax dichotomous cymes. Flowers $\frac{3}{4}$ by 1 inch long, very shortly stalked. Calyx loose, bell-shaped when in flower but becoming almost rotate in fruit, tinged with reddish brown, indistinctly nerved, and covered with

small reflexed hair-like points. Petals white, tinged with yellowish green; claw cylindrical, dilated where it passes into the oblong lamina, which has 2 strap-shaped not contiguous lobes, and 2 denticulate bosses or adnate scales at the base. Gynophore shorter than the round black berry-like fruit, which is about $\frac{3}{8}$ inch in diameter. Plant green, not glaucous, finely pubescent, with short curved hairs, having much the aspect of Stellaria aquatica in its mode of growth, shape, and size of leaves.

Berry-bearing Chickweed.

French, *Cucubale Porte-Baies.* German, *Beerentragender Hühnerbiss.*

This plant is also called the Berry-bearing Campion. The older botanists, and amongst them our friend Gerarde, write of it as the Berry-bearing Chickweed (Alsine baccifera), and praise its virtues as an emollient poultice.

GENUS IV.—SILENE. *Linn.* (*Godr.*)

Flowers without involucral scales at the base. Calyx subcylindrical, tubular-clavate, ovoid, bell-shaped or conical, 5-toothed or 5-cleft at the apex, generally 10- (but sometimes 20- or 30-) nerved, five of the nerves indicating the line of demarcation between the sepals. Petals with narrow linear or wedge-shaped claws, without raised longitudinal bands; laminæ spreading, entire, notched or bifid, generally with 2 scales at the base forming a crown. Stamens 10. Torus often more or less elongated into a stalk-like gynophore between the calyx and the other parts of the flower. Styles 3, more rarely 5. Capsule 1-celled, generally with imperfect partitions at the base, opening at the apex by twice as many teeth as there are styles. Seeds reniform, laterally compressed, tuberculated, with the hilum on the inner margin. Embryo peripherical, forming a semicircle or a complete circle.

A genus containing herbs of very various habit; stem frequently viscous in the upper part; flowers in a few of the species dicœcious.

The derivation of this generic name is somewhat obscure; but it is said to have been given by Linnæus, in allusion to the viscid frothy moisture on the stalks of many of the species, from σιαλον (*sialon*). Hence, too, the English name Catchfly, from the fact of many small insects becoming entangled in the plant. One author attributes the name to the memory of the disreputable god Silenus, whose example may have done much to mislead unwary sinners.

Section I.—BEHEN.

Inflorescence an irregular dichotomous corymb (primary axis short), sometimes reduced to a single flower. Calyx submem-

branous, bladdery, ovoid, faintly 20-nerved, with anastomosing veins between the nerves, loosely enveloping the capsule. Capsule with imperfect partitions.

SPECIES I.—SILENE INFLATA. *Sm.*

PLATE CXCIX.

Reich. Ic. Fl. Germ. et Helv. Vol. VI. *Caryoph.* Tab. CCXCIX. CCC. Fig. 5120. Cucubalus Behen, *Linn.* *Sm.* Eng. Bot. No. 164.

Rootstock slender, almost woody, with rather few ascending elongated barren shoots and erect or ascending branched flowering stems. Lower leaves obovate or oblanceolate; upper ones ovate, oblong-ovate or lanceolate-acuminate, sessile. Flowers drooping, generally numerous, in an irregularly dichotomous cyme. Calyx ovoid, umbilicate at the base, with 5 deltoid teeth at the apex, where it is slightly contracted. Petals with the laminæ oblong-obovate, bipartite, with rather narrow oblong-oblanceolate not contiguous lobes, and 2 small bosses at the base, but no distinct scales. Gynophore shorter than the capsule. Capsule globular-ovoid.

Var. α, *genuina.*

Whole plant entirely glabrous.

Var. β, *puberula.*

Stem and leaves more or less thickly clothed with very short curled hairs.

Roadsides and borders of fields and pastures, particularly in chalky and sandy districts. Rather common and generally distributed, though more rare in the North of Scotland. Var. α more common than var. β.

England, Scotland, Ireland. Perennial. Summer.

Stems decumbent at the base, 9 inches to 3 feet high, branched especially near the base. Leaves very variable in shape and size; those on the main stem 1½ to 3 inches long, those of the branches and barren shoots smaller. Uppermost bracts membranous. Peduncles equalling or exceeding the calyx. Flowers ⅞ inch long by ¾ inch across, or a little more. Calyx glabrous, whitish green, often tinged or veined with pale purple, with the nerves darker, and united by anastomosing veins. Petals white, with the claw dilated into an auricle on each side at the top; scales represented by 2 small irregular swellings. Styles 3 to 5. Capsule included in the calyx, more than twice as long as the gynophore, nearly globular but

slightly conical towards the apex, where it opens by short and slightly recurved teeth. Seeds orbicular-reniform, covered with concentric rows of small conical tubercles. Plant growing in large loose straggling tufts; very smooth in var. α (except the margins of the leaves, which are often ciliated), while in var. β the stem and leaves are both clothed with short curled hairs; but all intermediate states occur.

I have little doubt that M. Crépin is right in considering that S. vesicaria (Schrad.), S. puberula (Jord.), S. brachiata (Jord.), and S. oleracea (Bor.), are only states of one species; possibly even S. maritima ought to be considered as only a sub-species, but I have not myself seen the connecting forms which are said to exist.

Common Bladder Campion.

French, *Silène à Calice Enflé.* German, *Aufgeblasener Taubenkropf.*

This species is also called Spatting Poppy, White Bottle, and is well known in every country district where it grows. The young shoots have been used as a substitute for asparagus or green peas, and have the flavour of both. They ought to be gathered when about two inches long, and the more they are blanched the better. Bryant, in the "Flora Dietetica," says the culture of this plant would well reward the gardener's trouble. In Gothland they apply the herb externally in erysipelous eruptions. The leaves boiled are not unpalatable, and proved of great use as a vegetable to the inhabitants of Minorca in 1685, when a swarm of locusts destroyed the harvest.

SPECIES II.—**SILENE MARITIMA.** *With.*

PLATE CC.

Reich. Ic. Fl. Germ. et Helv. Vol. VI. *Caryoph.* Tab. CCXCIX. Fig. 5119.

Rootstock almost woody, much branched, with numerous short decumbent barren shoots and ascending nearly simple flowering stems. Lower leaves oblanceolate, upper ones oblong-elliptical or strap-shaped. Flowers nearly erect, generally solitary, rarely more than 3. Calyx ovoid, umbilicate at the base, with 5 deltoid teeth at the apex, where it is scarcely contracted. Petals with the laminæ broadly obovate, bipartite, with broad obovate contiguous or incumbent lobes and 2 distinct scales at the base. Gynophore shorter than the capsule. Capsule sub-globular.

On sand, shingle, or rocks by the sea, or on wet rocks on mountains. Common, and generally distributed wherever the conditions requisite for its growth are found.

England, Scotland, Ireland. Perennial. Summer and (on mountains) Autumn.

This plant certainly comes very near to S. inflata, with which it is joined by Mr. Bentham, but it grows in much more compact

tufts, often forming cushions. The stems are from 3 to 10 inches high. The leaves are thicker, almost fleshy, much smaller, from ½ to 1 inch long; the upper ones are generally more attenuated at the base, and much closer together on the barren shoots. The flowers sub-solitary (or with hardly ever more than 3 in the corymb), generally larger (about 1 inch across), and much handsomer, from the lobes of the petals being broader, and leaving no spaces betwixt themselves or the contiguous petals. The scales seem to be always present in S. maritima, while in S. inflata they are almost invariably absent. The bracts in S. maritima are more herbaceous (though this is not a constant character), the seeds are smaller, and have the tubercles usually much less acute. The whole plant is more glaucous, and is quite glabrous, except that the leaves are frequently ciliated.

Sea Bladder Campion.

French, *Silène Maritime.*

Section II.—CONOIMORPHA.

Inflorescence an irregular dichotomous cyme (primary axis short). Calyx at first sub-cylindrical, then swollen below (but not bladdery), ovate-conical, pointed, and fitting tightly to the capsule at the top, sub-membranous, with 30 strong herbaceous ribs and no anastomosing veins. Capsule with imperfect partitions.

Species III.—**SILENE CONICA.** *Linn.*

Plate CCI.

"S. conoidea,"* *Reich.* Ic. Fl. Germ. et Helv. Vol. VI. *Caryoph.* Tab. CCLXXV. Fig. 5061.

No perennial rootstock or barren shoots. Stems erect, dichotomously branched. Lower leaves linear-oblanceolate; upper ones linear-lanceolate, very acute. Flowers erect, numerous. Calyx at first cylindrical-conical, afterwards ovate-conical, umbilicate at the base, with 5 long triangular acuminate teeth at the apex. Petals with the laminæ oblong-oblanceolate, 2-cleft, with oblong-rounded lobes and a bipartite scale at the base. Gynophore extremely short, not so long as broad. Capsule shorter than the teeth of the calyx.

On sandy fields and commons. Very local. Abundant on the sandhills at Deal, and also at New Romney, Kent; at Bury,

* The names of "conoidea" and "conica" have been inadvertently transposed on Reichenbach's plates.

Thetford, and Ereswell, Suffolk; Brandon, Norfolk; and also on Dirleton Common, Haddingtonshire, and Montrose Links, Forfarshire; though possibly not native in the Scotch localities.

England, [Scotland]. Annual. Summer.

Crown of the root producing one or more stems, which are 2 to 15 inches high, irregularly dichotomously branched towards the top. Leaves all very narrow; the lower ones attenuated at the base, and less acute than the upper; the uppermost of all (or bracts) with numerous ribs and long acuminate points. Flowers ½ inch long by ⅜ inch across. Calyx truncate, intruded or umbilicate at the base (above which it swells out very much as the capsule increases in size), teeth nearly one-third the length of the whole. Petals with the claw dilated into 2 auricles at the top, and much longer than the lamina, which is rose-colour. Capsule ovoid-conical, nearly filling the calyx. Seeds roundish-reniform, with the edges of the parallel sides not rounded off, so as somewhat to resemble a vertebra, covered with very small tubercles. Plant green, with small hairs and sticky glands towards the upper part of the stem and on the calyx ribs.

Striated Campion or Catchfly.

French, *Silène Conique.* German, *Kegelkelchiger Taubenkropf.*

Section III.—VISCAGO.

Inflorescence pseudo-racemose or -spicate; sometimes forked, with a single flower in the fork (primary axis short). Calyx not bladdery; at first sub-cylindrical, afterwards ovoid, strongly 10-nerved, without anastomosing veins, tightly enclosing the capsule. Capsule with imperfect partitions.

SPECIES IV.—SILENE GALLICA. *Koch.*

Plates CCII. CCIII.

No perennial rootstock or barren shoots. Stem erect or decumbent. Lower leaves oblanceolate or obovate; upper ones oblong or linear. Flowers erect, in terminal racemes, alternate, sub-secund. Calyx at first cylindrical, afterwards ovoid, not umbilicate at the base, with 5 rather long triangular acuminate teeth at the apex, and 10 hairy ribs. Lamina of the petal oblong-obovate or -oblanceolate or elliptical, entire, denticulate or slightly notched at the tip, with 2 distinct scales at the base. Filaments hairy. Gynophore rudimentary. Capsule ovoid, about as long as the calyx teeth.

Sub-Species I.—**Silene anglica.** *Linn.*

Plate CCII.

Reich. Ic. Fl. Germ. et Helv. Vol. VI. *Caryoph.* Tab. CCLXXIII. Fig. 5056.
S. gallica, var. *β*, *Auct. Plur.*

Stem erect or ascending, flexuous, with spreading branches. Racemes lax. Fruiting pedicels (or at least the lower ones) generally longer than the calyx, spreading or reflexed. Lamina of the petals elliptical, scarcely half as long as the claw, white or tinged with pink.

In sandy fields, dry places, and gravel-pits. Not uncommon in the South of England, more rare in the North, and scarce in Scotland, where, however, it is not unfrequent in Haddingtonshire, and is also found in Moray on the East, and Ayr on the West side of that country.

England, Scotland, Ireland. Annual. Summer.

Stem 9 to 18 inches long, more or less distinctly dichotomously or trichotomously branched, with the branches spreading. Leaves varying in breadth, the lower ones narrowing at the base. Flowers white, sometimes tinged with pink, $\frac{3}{4}$ inch long by $\frac{3}{16}$ inch across, in a lax raceme, with a pair of leaf-like bracts at the base of each pedicel. Calyx with long white shaggy hairs, teeth about half as long as the tube. Petals very small and inconspicuous, elliptical or oblong-oblanceolate. Fruit peduncles variable in length and direction, but the lower ones generally exceeding the calyx, and spreading or deflexed. Capsule ovate-ovoid, opening by slightly diverging triangular teeth. Seeds small, reniform, with the edges not rounded off, the sides depressed so as to leave a raised margin, covered with minute tubercles. Whole plant more or less hairy, especially the stems, peduncles, and calices, which have long white hairs. The stem is sticky in the upper part; leaves deep green, not at all glaucous.

English Catchfly or Campion.

French, *Silène d'Angleterre.*

Sub-Species II.—**Silene quinquevulnera.**

Plate CCIII.

S. sylvestris, *Schmidt.* *Reich.* Ic. Fl. Germ. et Helv. Vol. VI. *Caryoph.* Tab. CCLXXII. Fig. 5055.
S. anglica, var. *β*, *Bab.* Man. Brit. Bot. ed. v. p. 46. *Hook. & Arn.* Brit. Fl. ed. viii. p. 59.

Stem erect, straight, with ascending branches. Racemes dense. Fruiting pedicels shorter than the calyx, erect. Lamina of the

petals obovate-roundish, more than half as long as the claw, white with a deep red disk.

In sandy places and gravel-pits. Rare in England, and probably only escaped from cultivation. Truly wild in Guernsey. In England it has occurred near Sandgate and Wrotham, Kent; Duppas Hill, Surrey; and Bury, Suffolk; also between Tunbridge Wells and Frant; Sussex; in Berkshire; and at Camphill, North-West Yorkshire.

[England,] Channel Islands. Annual. Summer.

Very like S. anglica, but much stouter in proportion to its height, which is from 6 to 18 inches. The branches are stiffer, not spreading and straggling, the flowers are much closer and the petals much larger than those of S. anglica, and with a deep dull crimson base and centre giving off lines towards the apex.

S. gallica, Linn. (S. eu-gallica, mihi), is probably only a variety of this plant, as the only difference appears to be that the petals are white without a red disk. I have retained the name "gallica" as that of the aggregate species, as it is adopted by Koch, Godron, and several other authors; it includes, besides the above, S. lusitanica (Linn.), S. cerastoides (D. C.), S. tridentata (D. C.), &c.

I have not seen British specimens of S. eu-gallica; but probably the late Dr. Bromfield is correct in referring to it a plant called by him S. anglica, var. stricta. This occurred "among oats at upper end of Colwell Heath," and in "a turnip-field on the farm at Kite Hill, by Wootton Bridge," Isle of Wight. However, as I have not seen specimens from these localities, I have not ventured to have a Continental specimen drawn for the present work.

Spotted Catchfly, Variegated Catchfly.

This species is sometimes cultivated on account of its bright pretty flowers.

Section IV.—ATOCION.

Inflorescence corymbose (primary axis short), or reduced to a solitary flower. Calyx sub-membranous, not bladdery, cylindrical-clavate or ovoid-funnelshaped, faintly 10-nerved, quite filled by the mature capsule. Capsule with imperfect partitions.

SPECIES V.—SILENE ARMERIA. *Linn.*

Plate CCIV.

Reich. Ic. Fl. Germ. et Helv. Vol. VI. *Caryoph.* Tab. CCLXXXIV. Fig. 5079.

No perennial rootstock. Stems erect, slightly viscous in the upper part. Flowers erect, numerous, in rather compact flat-topped

corymbose cymes. Calyx sub-membranous, coloured, cylindrical-clavate, umbilicate at the base, with 5 short obtuse teeth at the apex. Petals with the laminæ oblong-oblanceolate, emarginate, each with 2 long free subulate scales at the base. Gynophore as long as the capsule. Capsule about as long as the calyx.

By river-sides, in cornfields and in waste places, but only where it has escaped from gardens; and apparently not permanently naturalized in any locality.

[England, Scotland]. Annual. Summer.

Stem erect, hollow, simple or dichotomously or trichotomously branched in the upper part. Leaves sessile, 1 to 2 inches long, the lowest ones narrowed at the base, all acute and entire. Flowers very shortly stalked, $\frac{3}{4}$ inch long by $\frac{5}{8}$ inch broad. Calyx generally tinged with red; at first nearly cylindrical, but becoming more and more enlarged upwards as the capsule increases in size. Petals deep rose-colour or pale crimson; the lamina with 2 erect narrow acute scales about half as long as itself; claw not auricled at the apex. Capsule cylindrical-ovoid, rather shorter than the gynophore, opening by 6 revolute teeth, with 3 imperfect partitions not nearly meeting in the centre. Seeds blackish, flat on the sides, with a furrow on the back, finely rugose. Plant smooth, light green, glaucous.

Common Garden Catchfly, Lobel's Catchfly.

French, *Silène Armérie.* German, *Garten Taubenkropf.*

SPECIES VI.—SILENE ACAULIS. *Linn.*

PLATE CCV.

Reich. Ic. Fl. Germ. et Helv. Vol. VI. *Caryoph.* Tab. CCLXX. Fig. 5084.

Rootstock slightly woody, much branched, producing procumbent barren shoots and extremely short ascending flowering stems, with awl-shaped or linear-acute leaves. Flowers solitary, erect, imperfectly diœcious, shortly stalked or sub-sessile. Calyx tubular, oblong-rounded, scarcely umbilicate at the base, and with 5 rounded teeth at the apex. Petals with the laminæ oblong-obovate, more or less deeply notched at the apex, with a short notched scale at the base. Gynophore shorter than the capsule. Capsule usually much longer than the calyx.

On damp rocks and rocky débris on mountains. Common on those of Scotland, the North of England, and Wales.

England, Scotland, Ireland. Perennial. Summer and Autumn.

Stems with numerous short branches, so that the plant forms

cushions or flakes. Leaves from $\frac{1}{4}$ to $\frac{1}{2}$ inch long, varying in breadth, slightly fleshy, more or less channeled above and keeled beneath, ciliated at the edges. Peduncles short at first, but lengthening as the fruit matures, varying from 1 inch long to so short that the flowers appear to be sessile. Calyx sub-membranous, generally tinged with red, very faintly nerved; the teeth with scarious margins. Flowers $\frac{1}{4}$ inch long and $\frac{3}{8}$ inch across, deep rose-colour, but sometimes nearly white. Capsule cylindric-conical, generally exceeding the calyx, and frequently much exserted (resembling that of a Cerastium), usually conspicuously longer than the pubescent gynophore, opening at the apex by 5 narrowly-triangular erect teeth. Imperfect dissepiments very narrow. Seeds pale yellowish-brown, kidney-shaped, not furrowed on the back. Whole plant bright yellowish-green, glabrous, except the margins of the leaves; flowers generally, but not always, dicœcious.

Silene excapa (Allioni) can scarcely be separated, even as a variety; all the characters which are said to distinguish it being so liable to be crossed, that it is impossible to attach the slightest value to them.

Moss Campion.

French, *Silène à Courte Tige.*

Section V.—OTITES.

Inflorescence paniculate, with the primary axis much elongated, or producing lateral cymes as well as a terminal one. Calyx not bladdery, oblong-ovoid, bell-shaped, cylindrical-clavate or ovoid-funnelshaped, 10-nerved, quite filled or ruptured by the mature capsule. Capsule with imperfect partitions.

SPECIES VII.—SILENE OTITES. *Sm.*

Plate CCVI.

Reich. Ic. Fl. Germ. et Helv. Vol. VI. *Caryoph.* Tab. CCLXXXIX. Fig. 5094.
Cucubalus Otites, *Linn. Sm.* Eng. Bot. No. 85.

Rootstock perennial, thick, woody, much branched, producing very short barren shoots bearing tufts of radical leaves, and long erect flowering stems. Lower leaves spathulate-oblanceolate, attenuated into a footstalk; uppermost stem leaves sessile, lanceolate-linear. Flowers very numerous, erect, imperfectly dicœcious, in a contracted panicle with short sub-verticellate branches. Calyx tubular-ovoid, attenuated at the base (where it is not umbilicate), with 5 short obtuse teeth at the apex, quite glabrous. Petals with the laminæ scarcely spreading, strap-shaped, entire, without scales

at the base. Gynophore rudimentary. Capsule ovoid, a little longer than the calyx, which is ruptured by it at maturity.

In dry sandy fields and roadsides. Very local. In the counties of Norfolk, Suffolk, and Cambridge, where they adjoin each other about Brandon, Mildenhall, Thetford, and Chippenham.

England. Perennial. Summer.

Rootstock tufted at the apex, and producing numerous narrowly spathulate leaves, attenuated into a leafstalk, and varying from $\frac{3}{4}$ to 3 inches long, including the stalk. Lower stem leaves similar, but smaller; the upper ones shorter, and not at all enlarged at the apex. Panicle narrow, interrupted below, with the flowers appearing whorled, or the secondary branches bearing irregular umbels; more rarely the lower ones elongated with whorled flowers. Bracts membranous, connate. Pedicels generally exceeding the calyx. Flowers $\frac{3}{10}$ inch long by $\frac{1}{8}$ inch across. Calyx with the teeth membranous, rounded. Petals with the laminæ very narrow, pale yellowish-green, sub-erect; claw without auricles at the top. Stamens and styles exserted, the latter varying from 2 to 5. Seeds very small, roundish-reniform, channelled on the back, finely shagreened. Plant growing in small dense tufts, green, with the stem sticky as far up as the middle, its base and the margins of the leaves and bracts clothed with short hairs; flowers dioecious, with imperfect styles in the stameniferous, and imperfect stamens in the pistiliferous flowers.

Spanish Catchfly.

French, *Silène à Petites Fleurs.* German, *Ohrlöffel Taubenkropf.*

The specific name of this plant comes from ουϛ, οτοϛ (*ous, otos*), an ear, from the form of the leaves.

SPECIES VIII.—SILENE NUTANS. *Linn.*

PLATE CCVII.

Reich. Ic. Fl. Germ. et Helv. Vol. VI. *Caryoph.* Tab. CCXCV. Fig. 5108.

Rootstock perennial, slender, woody, branched, producing rather short barren shoots and erect flowering stems. Lower leaves oblanceolate, attenuated into a footstalk; uppermost stem-leaves sessile, lanceolate-linear. Flowers rather numerous, drooping, in a lax subsecund panicle. Calyx cylindrical-clavate, turbinate in fruit, very slightly umbilicate at the base, with rather short triangular teeth at the apex, pubescent. Petals with the laminæ slightly reflexed at the base, and slightly inflexed at the apex, obovate, bipartite, with oblong not contiguous segments, and with 2 triangular-lanceolate scales at the base; claws not auricled at the summit.

Gynophore about one-third the length of the capsule. Capsule ovate-ovoid, obtuse, about as long as the calyx, opening by spreading teeth.

On dry hills, rocks, walls, and borders of fields. Rare. It occurs in the Isle of Wight, and plentifully on the cliffs in South Kent; on the walls of Nottingham Castle; in Dovedale, Derbyshire; at Conway, North Wales. In Scotland it has been reported from Fife and Forfarshire; and I have also seen specimens from St. Cyrus, Kincardineshire.

England, Scotland. Perennial. Summer.

Rootstock producing numerous short barren tufts of leaves and flowering stems. Stems erect, 1 to 2 feet high. Lower leaves 3 inches long, including the leaf-stalk. Panicle with opposite elongated branches terminating in small dichotomous cymes and one at the apex of the main stem. Pedicels rather short. Flowers $\frac{1}{2}$ inch long by $\frac{3}{4}$ inch across. Calyx at first sub-cylindrical, but afterwards swelling out greatly towards the upper end, with the nerves purple (often this colour suffuses more or less the whole calyx). Petals white, or tinged with pink, each with 2 narrow diverging segments slightly incurved at the apex. Seeds reniform, not channelled on the back, with small tubercles. Plant yellowish-green, finely pubescent, with the upper part of the stem and calices viscous; flowers most expanded and fragrant in the evening, dimorphous, some having the styles elongated, and others having them short.

S. paradoxa of Smith is not distinguishable even as a variety.

Nottingham Catchfly.

French, *Silène Penché.* German, *Nickender Taubenkropf.*

SPECIES IX.—SILENE ITALICA. *Pers.*

PLATE CCVIII.

Reich. Ic. Fl. Germ. et Helv. Vol. VI. *Caryoph.* Tab. CCXCV. Fig. 5110.
S. patens, *Peete*, Eng. Bot. Sup. No. 2748.
Cucubalus italicus, *Linn.* Sp. Pl. p. 593.

Rootstock perennial, slender, woody, branched, producing elongated barren shoots and erect flowering stems. Lower leaves oblanceolate, attenuated into a footstalk; uppermost stem-leaves sessile, linear-lanceolate. Flowers rather few, sub-erect, in a very lax pyramidal panicle. Calyx cylindrical-clavate, widened towards the apex in fruit, very slightly umbilicate at the base, with roundish-ovate teeth at the apex, pubescent. Petals with the laminæ slightly inflexed at the apex, but not at all reflexed at the base, obovate,

2-cleft, with roundish-oblong nearly contiguous segments, and with 2 small bosses at the base; claws auricled at the summit. Gynophore as long as the capsule. Capsule oblong-ovoid, about as long as the calyx, opening by spreading teeth.

On roadsides and chalky ground. Very rare. It occurs along the side of the road between Dartford and Darenth, apparently perfectly wild. It has also been found on Salisbury Crags, Scotland.

England, [Scotland]. Perennial. Summer.

This plant very closely resembles S. nutans, but is less compactly tufted, the barren shoots and the decumbent base of the stem being longer. The flowering stems are from 9 inches to 2 feet high, with fewer and longer lateral branches than in S. nutans. Flowers nearly erect, $\frac{7}{8}$ inch long by $\frac{3}{4}$ inch across, white, tinged with pale yellow; the laminæ slightly concave, not at all reflexed, as in the former plant. The most conspicuous difference is in the gynophore, which is quite as long as the capsule; and as the fruiting calyx fits tightly over it, the relative length of the gynophore and capsule may be observed at a glance. The whole plant is softly hairy, with the stem and calices sticky; flowers dimorphous or sub-diœcious, opening only in the evening, and then fragrant.

Italian Catchfly.

French, *Silène Italique.*

Section VI.—MELANDRIUM.

Inflorescence in a nearly regular dichotomous cyme. Calyx not bladdery, cylindrical or elliptical-ovoid, at length broadly ovoid, 10-nerved, often ruptured by the mature capsule. Capsule without imperfect partitions.

SPECIES X.—SILENE NOCTIFLORA. *Linn.*

Plate CCIX.

Reich. Ic. Fl. Germ. et Helv. Vol. VI. *Caryoph.* Tab. CCLXXVI. Fig. 5063.

Melandrium noctiflorum, *Fries*, Sum. Veg. Scand. p. 36. *Garcke*, Fl. von Nord- und Mittel-Deutschland, ed. vi. p. 66.

No perennial rootstock nor barren shoots. Stems erect, with soft spreading hairs, and (as well as the calices) extremely viscid. Lower leaves obovate or oblanceolate, attenuated at the base, but scarcely stalked; uppermost leaves narrowly strapshaped-lanceolate, very acute. Flowers few, erect, perfect, in a dichotomous cyme. Calyx at first cylindrical, truncate but not umbili-

cate at the base, acuminate at the apex, where there are 5 long subulate teeth, and with 10 very prominent herbaceous nerves; in fruit ovoid, contracted a little way above the base. Petals with the laminæ oblong-oblanceolate, deeply cleft into 2 strap-shaped lobes, with 2 truncate toothed scales at the base; claws auricled on each side at the apex. Styles 3. Gynophore about one-sixth the length of the capsule, and about half its greatest diameter. Capsule ovoid-conical, opening by 6 spreading-recurved teeth.

In fields, on sandy and gravelly soil. Rather rare. Principally confined to the East side of the island, where it occurs from Sussex to Forfarshire.

England, Scotland, Ireland. Annual. Summer.

Stem erect, 1 to 2 feet high, generally dichotomously branched. Leaves generally 3 or 4 inches long, the form changing gradually as they are placed higher up on the stem; lower stem-leaves sometimes indistinctly 3-nerved. Flowers $\frac{7}{8}$ inch long by $\frac{3}{4}$ inch across. Calyx hairy and viscous, remarkably truncate at the base, with very slender ciliated teeth half as long as the tube, and having the points diverging before the flower opens; nerves very broad, herbaceous, upon a whitish membranous ground, frequently giving off a few anastomosing veins. At maturity the calyx becomes very broadly ovoid, suddenly bulging out a little way above the base where the junction of the capsule and gynophore takes place. Petals white, tinged with rose within and with yellow on the outside, rolled inwards during the day, spreading and fragrant at night. Capsule $\frac{3}{4}$ to 1 inch long, frequently (but not always) rupturing the calyx, the teeth of which surpass it. Seeds globose-reniform, with the angles rounded off on the back, covered with small tubercles. Plant dull green, soft and downy; the upper part of the stem and calices extremely sticky.

Night-flowering Catchfly.

French, *Silène Noctiflore.* German, *Gemeine Lichtnelke.*

SPECIES XI.—SILENE PRATENSIS. *Godr. & Gren.*

PLATE CCX.

Lychnis dioica, *Linn. Reich.* Ic. Fl. Germ. et Helv. Vol. VI. *Caryoph.* Tab. CCCIV. Fig. 5125.

Melandrium pratense, *Röhl,* ed. i. p. 274.

M. vespertinum, *Fries,* Sum. Veg. Scand. p. 36.

M. dioicum, *Coss.* Fl. de Paris, ed. i. p. 28.

M. album, *Garcke,* Fl. von Nord- und Mittel-Deutschland, ed. vi. p. 66.

Lychnis pratensis, *Spreng.* Fl. Hal. p. 138.

L. vespertina, *Sibth.* et *Auct. Plur.*

L. dioica, Flore albo, *Sm.* Eng. Bot. No. 1580.

Rootstock perennial or biennial, thick and almost woody, producing a few rather short barren shoots and erect flowering stems, with soft spreading hairs, and (as well as the calices) slightly viscid. Lower leaves oblanceolate or broadly elliptical, attenuated into long footstalks; upper leaves sessile, elliptical or lanceolate, acuminate. Flowers rather few, slightly inclined, diœcious, in a dichotomous cyme. Calyx at first elliptical-oblong, attenuated and not umbilicate at the base, slightly narrowed at the apex, where there are 5 narrowly triangular acuminate-obtuse teeth, and with 10 rather indistinct nerves; in fruit regularly ovoid, contracted at the apex. Petals with the laminæ obovate, deeply cleft into 2 broadly oblong lobes, with 2 toothed scales at the base; claw suddenly enlarged into auricles on each side, where it meets the lamina. Styles 5. Gynophore rudimentary, half the breadth of the capsule, that of the male flowers a little longer and much more slender. Capsule ovoid-conical, opening by 10 sub-erect or slightly-spreading teeth.

In cultivated ground, borders of fields, hedge-banks, and other open situations. Very common throughout Britain, as far North as the Grampians, beyond which it becomes scarce, and does not reach the extreme North of Scotland.

England, Scotland, Ireland. Perennial or Biennial. Summer and Autumn.

Stem 1 to 3 feet high, leaves of the barren shoots and base of the stem 3 to 6 inches long (including the footstalk), those about the middle of the stem elliptical, attenuated at both ends, the uppermost ones narrower and more approaching to lanceolate. Flowers $\frac{3}{4}$ inch long by 1 to $1\frac{1}{4}$ inch across. Calyx usually pale, with green veins, those which run into the teeth much more distinct than the intermediate ones; teeth narrow, plicate, acuminated to the rather obtuse apex. Petals white or very pale rose-colour, opening most fully in the evening, when they are slightly fragrant. Capsule very large, as long as the calyx teeth, and often rupturing the tube, hard and tough in texture; the teeth not at all revolute. Seeds small, roundish-reniform, with the angles not rounded off, covered with small tubercles. Whole plant covered with soft hairs; upper part of stem and calices slightly viscid; leaves deep green, firm.

It is to be regretted that Dr. Godron, in placing this species in the genus Silene, has adopted Sprengel's very inappropriate name of "pratensis," as the plant is never to be found in meadows.

White Campion.

French, *Lychnide Dioïque.* German, *Weisse Lichtnelke.*

SPECIES XII.—SILENE DIURNA. *Godr. & Gren.*

PLATE CCXI.

Lychnis diurna, *Sibth. Reich.* Ic. Fl. Germ. et Helv. Vol. VI. *Caryoph.* Tab. CCCIV. Fig. 5126.
Melandrium sylvestre, *Röhl*, ed. i. p. 274. *Coss.* Fl. de Paris, ed. ii. p. 37.
M. diurnum, *Fries*, Sum. Veg. Scand. p. 36.
M. rubrum, *Garcke*, Fl. von Nord- und Mittel-Deutschland, ed. vi. p. 66.
Lychnis diurna, *Sibth.* et *Auct. Plur.*
L. dioica, Flore rubro, *Sm.* Eng. Bot. No. 1579.

Rootstock perennial, slender, producing numerous somewhat elongated barren shoots and erect flowering stems with soft spreading hairs, and (as well as the calices) slightly viscid. Lower leaves obovate, attenuated into long footstalks; upper leaves sessile, oval or ovate, acuminate. Flowers rather numerous, slightly inclined, dicœcious, in a dichotomous cyme. Calyx at first elliptical-ovoid, rounded, and not umbilicate at the base, slightly narrowed at the apex, where there are 5 triangular acute teeth, and with 10 rather indistinct nerves; in fruit regularly roundish-ovoid, very little contracted at the apex. Petals with the laminæ obovate, deeply cleft into 2 oblong lobes, with 2 lanceolate acute scales at the base; claw gradually enlarged into auricles on each side, where it meets the lamina. Styles 5. Gynophore rudimentary, about one-eighth the breadth of the capsule. Capsule globular-ovoid, opening by 10 revolute teeth, usually more or less cohering in pairs.

In woods, shady hedge-banks, and on rocks by the sides of streams. Very common throughout Britain, reaching the extreme North.

England, Scotland, Ireland. Perennial. Spring and Summer.

This species is certainly closely allied to the last; but the plant is less rigid, the leaves softer and more flaccid, broader, and usually more distant on the stem. Calyx much shorter and broader (especially that of the fertile flowers), usually tinged with deep dull red or reddish-purple; teeth without the contraction just above the base, which exists in those of S. pratensis. Flowers smaller than in that plant, $\frac{1}{2}$ to $\frac{5}{8}$ inch long by $\frac{3}{4}$ to 1 inch across. The petals narrower, purplish rose-colour, usually deep, but sometimes pale. Capsule usually not above half as long, with a much wider opening at the apex, more brittle in texture, and very distinct in the way in which the teeth roll backwards. The gynophore of the capsule is also much more slender.

S. pratensis and diurna have occasionally been confounded through the occurrence of forms of each which approximate in

colour; and probably there exist hybrids between them, of which Mr. J. G. Baker has sent me what he believes to be examples. One of these marked "vespertino-diurna" may be so; but that called "diurno-vespertina" appears to me only a pale variety of S. diurna; though, in the absence of the mature capsule, it is difficult to give a decided opinion.

Red Campion.

French, *Lychnide Rouge.* German, *Rothe Lichtnelke.*

GENUS V.—LYCHNIS. *Linn.*

Flowers without involucral scales at the base. Calyx sub-cylindrical, tubular-clavate or ovoid, 5-toothed or 5-cleft at the apex, 10-nerved, five of the nerves indicating the line of demarcation between the sepals. Petals with narrow linear or wedge-shaped claws, generally destitute of raised longitudinal bands; laminæ spreading, entire, notched, bifid or 4-cleft, usually with 2 scales at the base forming a crown. Stamens 10. Torus often more or less elongated into a stalk-like gynophore between the calyx and other parts of the flower. Styles 5. Capsule 1-celled, often with imperfect partitions at the base, opening at the apex by as many teeth as there are styles. Seeds reniform, tubercular or smooth, with a lateral hilum. Embryo peripherical, forming a semicircle or a complete circle.

The separation of this genus from Silene has no foundation in nature. By following Dr. Godron in removing Melandrium to Silene, a slight improvement is effected, as otherwise the characters depend solely on the number of styles, which varies in several species of Silene. By taking Dr. Godron's view of Silene, that genus and Lychnis have the same relation to each other as Arenaria and Alsine.

The name of this genus of plants is derived from λυχνος (*luchnos*), a torch, either because its leaves were anciently used in making torches, or in allusion to its flame-coloured and flickering petals. Some writers conjecture that the name arose from the resemblance of its semitransparent calyx to a lantern.

Section I—EU-LYCHNIS.

Calyx sub-membranous or herbaceous, with 5 short teeth at the apex. Petals with scales at the base of the lamina, which is notched, cleft, or partite. Capsule without imperfect partitions.

SPECIES I.—LYCHNIS FLOS-CUCULI.

PLATE CCXII.

Reich. Ic. Fl. Germ. et Helv. Vol. VI. *Caryoph.* Tab. CCCVI. Fig. 5129.
Coronaria Flos-cuculi, *Braun. Garcke*, Fl. von Nord- und Mittel-Deutschland, ed. vi. p. 65.

Flowers in a terminal dichotomous cyme, with branches below it, so as to form a loose panicle. Calyx tubular-bellshaped, ovoid in fruit, with deltoid teeth. Petals cleft beyond the middle into 4 linear segments. Gynophore rudimentary.

In marshes and moist meadows. Common.

England, Scotland, Ireland. Perennial. Early Summer.

Rootstock slender, producing decumbent barren shoots and erect flowering stems, 1½ to 2½ feet high. Leaves of the barren shoots and those at the base of the stem narrowly-oblanceolate, attenuated at the base into short footstalks. Upper stem-leaves strapshaped-lanceolate, 2 to 4 inches long. Bracts small, linear-lanceolate. Flowers about ½ inch long, 1¼ to 1½ inch across, in a dichotomous cyme, which has generally an opposite pair of dichotomous cymes in the axils of the pair of leaves next below those at the base of the terminal cyme. Peduncles long and slender. Calyx usually tinged with dull red, with 10 purplish veins, and terminating in 5 short acuminated teeth with membranous margins. Petals rose-colour, with the laminæ palmately cleft into 4 very narrow segments, with 2 long bifid subulate scales at the base. Capsule roundish-ovoid, opening widely at the apex by 5 revolute teeth. Seeds very small, reniform-roundish, covered with small tubercles. Leaves green, flaccid, glabrous, scarcely glaucous. The upper part of the stem rough with small points.

Ragged Robin, Rose of Heaven, Smooth Lychnis, Meadow Pink, Wild Williams.

French, *Lychnide Laciniée.* German, *Kukuks Kranzrade.*

The common name of this wayside and pretty plant, "Ragged Robin," is perhaps a corruption of its more poetical epithet, "Rose of Heaven." It is also called Crow-flower, Cuckoo-flower. Many of the species of the genus Lychnis are cultivated in gardens, but they are chiefly foreigners; this species, however, is an elegant hardy perennial, the seeds of which only require to be sown in an open border.

SECTION II.—VISCARIA.

Calyx sub-membranous, with 5 short teeth at the apex. Petals with scales at the base of the lamina, which is slightly notched or bifid. Capsule with imperfect partitions.

SPECIES II.—LYCHNIS VISCARIA. *Linn.*

PLATE CCXIII.

Reich. Ic. Fl. Germ. et Helv. Vol. VI. *Caryoph.* Tab. CCCVII. Fig. 5131.
Viscaria purpurea, *Wimm.* *Fries,* Sum. Veg. Scand. p. 36. *Gr.* & *Godr.* Fl. de Fr. Vol. I. p. 221.
V. vulgaris, *Rohl.* *Garcke,* Fl. von Nord- und Mittel-Deutschland, p. 65.

Flowers in a narrow elongated interrupted panicle. Calyx tubular-clavate, at length much widened towards the top, umbilicate at the base, with 5 deltoid acute teeth at the apex. Petals with the laminæ very slightly notched. Gynophore nearly as long as the capsule.

On trap and limestone rocks. Very local. On Craig Breidden, Montgomeryshire, and Stannar Rocks, Radnor; Arthur's Seat and Blackford Hill, Edinburgh; Orrock Hill and near Newborough, Fifeshire; Dumyatt Hill, Stirlingshire; near Airly Castle, Forfar; Glengary and Den of Balthayock, Perthshire; in Roxburghshire and Kirkcudbright.

England, Scotland. Perennial. Early Summer.

Rootstock rather thick, woody, with short divisions, producing very short barren shoots resembling dense tufts of radical leaves; and erect flowering stems, 1 to 2 feet high. Leaves of the barren shoots elliptical-linear, very acute, attenuated at the base into very ill-defined footstalks, 2 to 5 inches long; upper leaves strapshaped-lanceolate. Bracts broadly-lanceolate, acuminate, usually purple. Panicle composed of numerous pairs of shortly-stalked and few-flowered cymes, and terminated by a similar one. Peduncles extremely short. Flowers $\frac{5}{8}$ inch long by $\frac{3}{4}$ inch across. Calyx membranous, generally purple, faintly nerved, much dilated towards the apex when in fruit. Petals purplish-red, with the laminæ deltoid-obovate, very slightly notched, with 2 conspicuous scales at the base; claw auricled at the apex. Capsule roundish-ovoid, a little longer than the slender gynophore, opening by 5 slightly-spreading teeth. Seeds very small, reniform, tuberculated. Plant dark green, often more or less tinged with purple, glabrous, except the edges of the base of the leaves or petioles (where there is a woolly fringe) and a few short hairs on the calices; stem extremely sticky below each node.

Red German Catchfly, Cuckoo-flower.

French, *Lychnide Visqueuse.* German, *Gemeine Pechnelke.*

SPECIES III.—LYCHNIS ALPINA. *Linn.*

PLATE CCXIV.

Reich. Ic. Fl. Germ. et Helv. Vol. VI. *Caryoph.* Tab. CCCVII. Fig. 5130.
Viscaria alpina, *Fries*, Sum. Veg. Scand. p. 36. *Gr. & Godr.* Fl. de Fr. Vol. I. p. 222.

Flowers in a contracted sub-corymbose panicle resembling a head. Calyx bellshaped-ovoid, at length somewhat funnel-shaped, not umbilicate at the base, with 5 rounded teeth at the apex. Petals with the lamina cleft into 2 oblong lobes. Gynophore scarcely one-fourth the length of the capsule.

On gravelly knolls, and in ravines on mountains. Very rare. On Hobcartin Fell, Vale of Lorton, Cumberland; and on Little Kilrannoch, between Glen Prosen and Glen Callater, Forfarshire.

England, Scotland. Perennial. Late Summer.

Rootstock dividing into very short branches, terminating in rosettes of radical leaves and erect flowering stems, 3 to 7 inches high. Leaves strap-shaped, the lower ones slightly narrowed below. Flowers in a terminal fascicle, with a few pairs of fascicles often reduced to a solitary flower beneath them, without any distinct interval between the terminal and lateral fascicles (not interrupted). Peduncles very short. Bracts ovate-acuminate, rose-coloured. Flowers $\frac{1}{4}$ inch long by $\frac{3}{8}$ inch across. Calyx faintly nerved, with rounded teeth having membranous purplish margins. Petals rose-colour, with the limb obovate, with 2 short scales at the base. Capsule roundish-ovoid, opening widely at the apex by 5 recurved teeth. Seeds very small, reniform, finely tuberculated. Leaves rather firm, pale green. Plant glabrous, not viscous.

Red Alpine Catchfly.

French, *Lychnide des Alpes.*

SECTION III.—GITHAGO.

Calyx sub-coriaceous, terminating in 5 foliaceous linear acute lobes longer than the calyx tube and corolla. Petals with the lamina nearly entire, without scales at the base. Capsule without imperfect partitions.

SPECIES IV.—LYCHNIS GITHAGO. *Lam.*

PLATE CCXV.

Githago segetum, *Desf. Reich.* Ic. Fl. Germ. et Helv. Vol. VI. *Caryoph.* Tab. CCCVIII. Fig. 5132.

Agrostemma Githago, *Linn. Sm.* Eng. Bot. No. 741. *Hook. & Arn.* Brit. Fl. ed. viii. p. 62.

Koch, Syn. Fl. Germ. et Helv. ed. ii. p. 117. *Fries*, Sum. Veg. Scand. p. 36. *Gr. & Godr.* Fl. de Fr. Vol. I. p. 224.

Flowers solitary. Calyx woolly, with 10 very prominent ribs. Petals slightly emarginate, shorter than the lobes of the calyx.

A cornfield weed. Common, and generally distributed.

England, Scotland, Ireland. Annual. Summer.

No rootstock or barren shoots. Stem erect, 1 to 4 feet high, with a few ascending branches. Leaves strapshaped-linear, acute, 2 to 5 inches long. Flowers terminating the stem and branches, $\frac{7}{8}$ to $\frac{3}{4}$ inch long by $1\frac{1}{4}$ to $1\frac{1}{2}$ inch across. Peduncles very long. Calyx cylindrical-ovoid, becoming much swollen in fruit, with the ribs very prominent, and the teeth produced into segments closely resembling the leaves, from 1 to $1\frac{1}{2}$ inch long. Petals with the limb deltoid-roundish, very faintly notched at the apex, pale purple, darker towards the apex, with 3 to 5 lines formed of dark purple dots radiating from the base; claw linear, with raised bands. Capsule ovoid, opening by 5 slightly-reflexed teeth. Seeds large, black, angular-reniform, with concentric rows of acute-pointed tubercles. Plant green, covered with adpressed white hairs, longest and most closely placed on the stem; calyx not at all viscid.

Corn Cockle.

French, *Lychnide Nielle.* German, *Korn Rade, Acker Rade.*

SUB-ORDER II.—ALSINEÆ.

Sepals distinct. Petals, stamens, and ovary sessile within the calyx. Styles free, 3, 4, or 5. Stipules none.

GENUS VI.—HOLOSTEUM. *Linn.*

Sepals 5, sub-erect. Corolla of 5 petals, irregularly denticulate at the apex, or very rarely entire. Stamens 3 to 5 (very rarely 10), hypogynous. Styles 3 (rarely 4 or 5). Capsule generally longer

than the sepals, ovoid-cylindrical, 1-celled, opening at the apex by twice as many teeth as there are styles, and afterwards dividing into as many valves. Seeds numerous, black, rough, reniform-globose, laterally compressed, nearly flat on the back (round which there is a very shallow furrow), and with a short raised band, or keel, near the hilum, indicating the position of the latter.

Small glaucous annuals, generally glabrous, with the exception of the top of the stem and peduncles, which are pubescent and viscid. Flowers in a terminal simple umbel, which is surrounded by a few bracts.

The name of this genus of plants appears by all writers to have arisen in a joke, and to mean the direct opposite of what it conveys. The plants are peculiarly delicate and soft; and yet the name signifies ὁλος (*holos*), all, and οστεον (*osteon*), a bone,—"all bone."

SPECIES I.—HOLOSTEUM UMBELLATUM. *Linn.*

PLATE CCXVI.

Reich. Ic. Fl. Germ. et Helv. Vol. V. *Caryoph.* Tab. CCXXI. Fig. 4901.

Radical leaves oblanceolate, attenuated at the base. Stem-leaves about 2 pairs, oval or oblong, those of each pair more or less united at the base. Petals longer than the sepals. Seeds granulated, with small rounded tubercles. Plant glabrous, except the top of the stem.

In dry places, and on walls and thatched roofs. Very rare. On old walls,—such as in St. Faith's Lane, in the northern part of Norwich; and about Bury, Suffolk.

England. Annual. Spring.

Stem dividing into several close to the crown of the root (or in small specimens quite simple), from 1 to 8 inches high. Radical leaves soon withering, variable in breadth, but always attenuated at the base, ½ to 1 inch long; stem-leaves rather remote (especially in the upper part of the stem), generally rather acute, but sometimes obtuse. Umbel from 2- to 6-flowered, at first sessile in the upper pair of leaves, afterwards removed from them by the elongation of the stem. Pedicels at first very short, but by the time the fruit is mature about three times the length of the calyx, at first erect, then reflexed, and lastly again erect. As the apparent umbel is really a contracted cyme, the flowers expand at a considerable interval, and from this cause the pedicels are unequal in length until they have all attained maturity. Involucral bracts small, oblong-ovate, acute, membranous. Flowers about ¼ inch across. Sepals oblong-ovate, obtuse, membranous and often purplish at the

margins, faintly nerved. Petals one-fourth or one-half longer than the sepals, irregularly toothed or crenate at the apex (very rarely quite entire), white (rarely tinged with rose), oblong. Stamens and styles generally 3 each. Capsule about twice as long as the sepals, usually opening by 6 teeth, slightly reflexed at the apex, the divisions between the teeth being prolonged downwards so as to convert them into valves. Seeds very minute, black. Plant pale green, glaucous, with the leaves rather fleshy; the upper part of the stem generally with very short glandular hairs.

The preceding description is taken from the Norwich plant. On the Continent it often attains a larger size, and has much more numerous flowers.

Umbelliferous Jagged Chickweed.

French, *Holostée en Ombelle.* German, *Doldenblüthige Spurre.*

GENUS VII.—CERASTIUM. *Linn.*

Sepals 5 (or more rarely 4), sub-erect. Petals 5 (or 4 when the sepals are only 4), bifid or notched at the apex, rarely entire, occasionally abortive. Stamens twice as many as the sepals (or more rarely only as many), hypogynous. Styles 5, more rarely 4. Capsule generally much longer than the sepals, cylindrical or conic-cylindrical or conic-ovoid, 1-celled, most frequently slightly curved upwards, opening at the apex by twice as many teeth as there are styles; teeth short, straight, or more rarely recurved. Seeds numerous, brown, rough, globose-reniform, laterally compressed.

Small annual or perennial herbs, generally pubescent or hairy, rarely smooth and glaucous. Leaves commonly elliptical or oblong, and not rigid. Flowers white (very rarely tinged with blue), in terminal dichotomous cymes, sometimes reduced to a single flower.

The name of this genus comes from κερας (*keras*), a horn, to which the capsule bears some resemblance.

Section I.—MŒNCHIA. *Ehrh.*

Calyx with longly-acuminated sepals. Petals oblong, entire or very slightly notched. Stamens 4, 8, or 10. Styles 4 or 5. Capsule not exserted, or but very slightly exceeding the sepals, opening by 8 or 10 slightly-recurved teeth. Glabrous and glaucous plants.

SPECIES I.—CERASTIUM QUATERNELLUM. *Fenzl.*

PLATE CCXVII.

Mönchia erecta, *Reich.* Ic. Fl. Germ. et Helv. Vol. V. *Caryoph.* Tab. CCXXXVII. Fig. 4953.
Cerastium glaucum γ, quaternellum, *Gr. & Godr.* Fl. de Fr. Vol. I. p. 266.
Mönchia erecta, *Sm.* et *Auct. Plur.*
M. glauca, *Pers.* Syn. Vol. I. p. 153.
M. quaternella, *Ehrh.* Beitr. Vol. II. p. 178.
Sagina erecta, *Linn. Sm.* Eng. Bot. No. 609.

Stems erect or ascending, straight and rather rigid, slightly branched at the base. Leaves strap-shaped, or the upper ones lanceolate. Flowers on erect naked peduncles, which are much longer than the calyx, and terminate the stem and branches. Sepals 4, elliptical-lanceolate, very acute, with a broad white membranous margin. Petals 4, oblong, entire, shorter than the sepals. Stamens 4. Styles 4. Capsule cylindric-conical, a little longer than the sepals, opening by 8 slightly-recurved teeth. Plant glabrous and glaucous.

On dry gravelly commons and pastures. Not uncommon in the South of England, but becoming more rare towards the North, where Northumberland is its northern limit.

England, Ireland. Annual. Spring and Early Summer.

Stem with the central division erect, the lateral ones ascending and often decumbent at the base, 1 to 5 inches long. Radical leaves in a rosette, strap-shaped, narrowed at the base, acute, soon decaying; stem-leaves 2 to 4 pairs, shorter than the radical leaves, narrowly-lanceolate. Cyme generally reduced to from 1 to 3 flowers with very long peduncles, so that they may be as properly termed solitary flowers. Bracts of the secondary flowers of the cyme lanceolate, cuspidate, about one half membranous, with a strong central and 2 faint lateral nerves. Flowers about ¼ inch across, white. Sepals very acute, with broad conspicuous white membranous margins. Petals very slightly spreading, considerably shorter than the sepals. Styles very short. Capsule usually about equal to the sepals, but sometimes a little exceeding them; teeth with revolute margins, and sometimes separating downwards towards the base of the capsule. Seeds reddish-brown, shagreened. Whole plant glabrous, pale glaucous green; the stems often tinged with dull purple.

Upright Mœnchia, or Chickweed.

French, *Moënchie Droite.* German, *Aufrechte Mönchie.*

Section II.—ORTHODON. *Seringe, in D. C.*

Calyx with the sepals not acuminated. Petals obovate, bifid; or oblong and more or less distinctly notched at the apex. Stamens 10, 8, 5, or 4. Styles 5 or 4. Capsule generally exserted, and more or less distinctly curved, opening at the apex by twice as many erect teeth as there are styles. Generally pubescent or woolly plants, with the inflorescence in dichotomous cymes. Petals sometimes very short or abortive. Leaves firm and rather thick.

Species II.—CERASTIUM TETRANDRUM. *Curt.*

Plate CCXVIII.

C. atrovirens, *Bab. Reich.* Ic. Fl. Germ. et Helv. Vol. V. *Caryoph.* Tab. CCXXVIII. Fig. 4969. (Exclude C. pumilum, *Curtis.*)

C. tetrandrum, *Bab.* Man. Brit. Bot. ed. v. p. 56. *Hook. & Arn.* Brit. Fl. ed. viii. p. 72. *Koch,* Syn. Fl. Germ. et Helv. ed. ii. p. 133.

C. pumilum, *Gr. & Godr.* Fl. de Fr. Vol. I. p. 269 (non *Curt.*). *Boreau,* Fl. du Centre de la Fr. ed. iii. Vol. II. p. 112.

Sagina cerastoides, *Sm.* Eng. Bot. No. 166.

Root annual. Stems diffusely branched, ascending or decumbent. Stem-leaves oval or oblong-oval. First pair of bracts* as large as the stem-leaves; secondary bracts oval, shorter than the flowering pedicels; all entirely herbaceous. Sepals oblong-lanceolate, acute, with membranous margins, the herbaceous part covered with rather short gland-tipped hairs and a few simple articulated ones. Petals about equal to the sepals, oblong, notched at the apex, with several branched veins. Fruit-stalks longer than the calyx, erect, very rarely recurved or reflexed at any stage of their growth. Capsule about as long as the sepals, nearly straight, erect, in a straight line with the pedicel.

On sandy seashores, dry banks, walls, and rocks. Rather common on the coast. Common in the North of Ireland and in Scotland, extending to Orkney and Shetland.

England, Scotland, Ireland. Annual. Summer.

Plant dividing into numerous branches at the crown of the root; branches 3 to 12 inches long. Lowest leaves oblanceolate; stem-leaves variable in shape, but usually oval, acute; the upper-

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* *I. e.*, the pair of leaves from the axils of which the first lateral branches of the dichotomous cyme are given off.

most ones becoming gradually broader and shorter until the pair where the branching of the cyme commences; above this the leaves or bracts become smaller, but still remain entirely green, without any membranous margin. Peduncles when full grown longer than the calyx. Flowers about ¼ inch across. Sepals very acute, with a white membranous strip all round the margin and apex. Petals seldom exceeding the sepals, and often not so long. Capsule very little longer than the sepals. Seeds orange-brown, with concentric rows of small rather distant tubercles. Whole plant deep dull green, very viscous, thickly covered with short spreading hairs, each terminated by a sticky gland; and besides these glandular hairs, the leaves are covered with longer sub-adpressed hairs, some of which also occur towards the apex of the sepals.

The parts of the flower are often in fours (whence the specific name); but there are so frequently five, that no dependence can be placed upon the flowers being tetramerous or pentamerous as a distinguishing character in the group to which C. tetrandrum belongs.

Dark Green Mouse-ear Chickweed.

French, *Céraiste Grêle.*

SPECIES III.—CERASTIUM PUMILUM. *Curt.*

PLATE CCXIX.

Reich. Ic. Fl. Germ. et Helv. Vol. V. *Caryoph.* Tab. CCXXVIII. Fig. 4969.

Bab. Man. Brit. Bot. ed. v. p. 56. *Coss. & Germ.* Fl. des Environs de Paris, ed. ii. p. 48.

C. glutinosum, *Fries,* Nov. Fl. Suec. ed. ii. p. 132. *Koch,* Syn. Fl. Germ. et Helv. ed. ii. p. 133. *Gr. & Godr.* Fl. de Fr. Vol. I. p. 268; et *Auct. Plur.*

C. obscurum, *Chaub.* ap. St. Am. Fl. Agen. p. 180.

Root annual. Stems slightly branched at the base, erect or ascending. Stem-leaves elliptical or oblong-oval. First pair of bracts smaller than the stem-leaves, lanceolate-ovate, entirely herbaceous; secondary bracts broadly-lanceolate, much shorter than the flowering pedicels, with a narrow white membranous margin. Sepals oblong-lanceolate, acute, with rather broad membranous margins, the herbaceous part covered with numerous rather short gland-tipped hairs and a few simple articulated ones. Petals about as long as the sepals, oblong, distinctly notched at the apex, with several branched veins. Fruit-stalks longer than the calyx, recurved or reflexed after flowering, ultimately nearly erect. Capsule exserted, not quite twice as long as the sepals, slightly curved upwards, and a little inclined to the line of the pedicel so as to form an obtuse angle with it.

On dry banks and on rocks. Apparently rare. I have only seen specimens from Bembridge Down, Isle of Wight, and St. Vincent's Rocks, Bristol. The plant originally figured by Curtis was found by Mr. Dickson near Croydon, Surrey.

England. Annual. Spring.

Stem dividing into several at the crown of the root, 1 to 3 inches high. Lower leaves oblanceolate; the stem-leaves usually narrower than those of C. tetrandrum. The bracts at the base of the cyme are much smaller in proportion to the size of the leaves, and the upper bracts have distinct though very narrow scarious margins. The flowers are less erect. The white scarious border of the sepals is also much broader than in the last-named plant. The plant has more non-glandular hairs intermixed with the glandular ones, and the colour is a paler and yellower green, often tinged with dull purple. The capsule is nearly twice as long, and distinctly curved.

The Continental specimens are often considerably larger than the dimensions given above.

Dr. Walker Arnott, in Hooker's "British Flora," is inclined to regard C. pumilum as the pentandrous or early-flowering state of C. triviale; but he appears to have seen no specimens, and only to found his judgment on the figure in Curtis's "Flora Londinensis." This figure is on the whole very good; but the capsule is represented as more than twice as long as the calyx, while in the specimens I have had the opportunity of examining I have always found it a little less. This fact, and the colour of the plant in the plate, have no doubt helped to produce the impression that it belongs to C. triviale, from which it appears to be decidedly distinct, as the sepals are acute, not obtuse, and the numerous glandular hairs on the sepals and peduncles furnish an obvious though not an important distinction between it and the small annual state of C. triviale. C. pumilum has been generally confounded with C. semidecandrum, and I myself at one time fell into the error of considering it merely a state of that plant; but when Mr. A. G. More had sent me fresh specimens so as to permit an examination of the petals, I was obliged to admit with him that it was almost as nearly allied to C. tetrandrum, from which the chief points of difference are the scarious margins of the bracts and broader margins to the sepals, the much longer and more curved and inclined capsule, and the reflexed pedicels; which last character, however, sometimes, though rarely, occurs in C. tetrandrum.

Curtis's Mouse-ear Chickweed.

French, *Céraiste Nain.*

SPECIES IV.—CERASTIUM SEMIDECANDRUM. *Linn.*

PLATE CCXX.

Reich. Ic. Fl. Germ. et Helv. Vol. V. *Caryoph.* Tab. CCXXVIII. Fig. 4968.

Root annual. Stems branched at the base, erect or ascending. Stem-leaves oblong-oval. First pair of bracts smaller than the stem-leaves, oblong-ovate, with a broad scarious margin; secondary bracts broadly-lanceolate, much shorter than the flowering pedicels, membranous, with a narrow herbaceous central portion. Sepals oblong-lanceolate, acute, with broad membranous margins, the herbaceous part covered with numerous short gland-tipped hairs and a few articulated ones. Petals shorter than the sepals, narrowly oblong, erose but not distinctly notched at the apex, with a few simple veins. Fruit-stalks longer than the calyx, reflexed after flowering, ultimately nearly erect. Capsule exserted, less than twice as long as the sepals, very slightly curved upwards, and a very little inclined to the line of the pedicel.

On dry banks and on walls and rocks. Very common in England and the South of Scotland, but becoming rare in the North.

England, Scotland, Ireland. Annual. Spring.

Stems dividing into several at the crown of the root, 1 to 8 inches high. Lower leaves oblanceolate; stem-leaves varying from oval to oblong-elliptical. First pair of bracts very much smaller than the pair of leaves below them, and with a broad white membranous margin; the upper bracts with still more of the edges membranous and laciniated at the margins. Flowers very similar to those of C. pumilum, but the petals considerably smaller and having the veins unbranched; the sepals have also broader membranous margins. Capsule shorter and straighter than in that species, but decidedly longer than in C. tetrandrum. Plant light green, with a greyish tint; the glandular pubescence similar to that of the two preceding species, but shorter.

This plant has quite the habit of C. pumilum, but the petals are very different; and all the bracts have membranous margins, the upper ones being half or three-quarters membranous; the margins of the sepals are also more broadly membranous, and the capsule generally shorter.

Little Mouse-ear Chickweed.

French, *Céraiste Pentandre.* German, *Fünfmänniges Hornkraut.*

SPECIES V.—CERASTIUM GLOMERATUM. *Thuill.*

PLATE CCXXI.

C. vulgatum, "*Linn.*" *Reich.* Ic. Fl. Germ. et Helv. Vol. V. *Caryoph.* Tab. CCXXIX. Fig. 4970.

C. vulgatum, "*Linn.*" *Hook. & Arn.* Brit. Fl. ed. viii. p. 71. *Sm.* Eng. Bot. No. 789.

C. viscosum, *Linn. Fries.* Sum. Veg. Scand. p. 37. *Gr. & Godr.* Fl. de Fr. Vol. I. p. 267.

Root annual. Stems branched at the base, erect or ascending. Stem-leaves oval or oblong-oval. First pair of bracts smaller than the stem-leaves, ovate, entirely herbaceous; secondary bracts ovate, and also entirely herbaceous, about as long as, or even longer than, the flowering pedicels. Sepals lanceolate, very acute, with narrow membranous margins, the herbaceous part with distant gland-tipped hairs and (especially towards the apex) numerous long articulated ones without glands. Petals about equal in length to the sepals, or a little longer, oblong, bifid at the apex (sometimes absent). Fruit-stalks always erect, shorter than the calyx. Capsule exserted, twice as long as the calyx, curved upwards, inclined to the line of the pedicel.

In dry places. Common, and generally distributed.

England, Scotland, Ireland. Annual. Spring to Autumn.

Stems dividing at the crown of the root, as in the preceding species, but more numerous, 3 to 18 inches high. Root-leaves oblanceolate or obovate; stem-leaves generally very broadly oval, but varying to oval-elliptical. Flowers scarcely $\frac{1}{4}$ inch across, white, fasciculate from the shortness of the pedicels and from the branches of the corymb not lengthening until the fruit is nearly mature. Sepals much more acute than in the three preceding species, with fewer glandular and more long articulated hairs, the latter extending beyond the apex: sometimes the glandular hairs are entirely absent. The petals are described by some authors as being hairy at the claw.* Capsule at least twice as long as the sepals (sometimes considerably more), very distinctly curved upwards. Seeds pale yellowish-brown, minute, obovate-roundish, much compressed, rough with minute points. Plant pale yellowish-green, covered with hairs as in the last species, but the glandular hairs are rather fewer in proportion to the long white ones.

A small apetalous form sometimes occurs, as at Red Hill, Surrey.

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* I have not observed this feature in any of the specimens I have examined, so that it is probably inconstant.

This is smaller in all its parts (1 to 4 inches high), it has the capsule shorter (not quite twice as long as the calyx), but appears to be rather a starved state than an actual variety.

It seems better to adopt the name "glomeratum," as Linnæus himself seems to have confounded his C. vulgatum and viscosum; and even yet there is no agreement amongst authors respecting the proper application of the two latter.

Broad-leaved Mouse-ear Chickweed.

French, *Céraiste Commun.* German, *Geknäultes Hornkraut.*

SPECIES VI.—CERASTIUM TRIVIALE. *Link.*

PLATE CCXXII.

Reich. Ic. Fl. Germ. et Helv. Vol. V. *Caryoph.* Tab. CCXXIX. Fig. 4972.
C. viscosum, "*Linn.*" *Sm.* Eng. Bot. No. 790.
C. vulgatum, "*Linn.*" *Fries,* Nov. Fl. Suec. p. 125.
C. vulgare, *Hartm.* Scand. Fl. ed. i. p. 182.

Root perennial or annual, in the former case producing more or less elongated decumbent barren shoots. Flowering stems branched at the base, where they are decumbent, then erect, or ascending. Leaves of the barren shoots oblanceolate or narrowly-obovate; leaves of the flowering stem strap-shaped, oblong, or elliptical. First pair of bracts much smaller than the stem-leaves, ovate-lanceolate, entirely herbaceous; secondary bracts much shorter than the flowering pedicels, with narrow membranous margins, or sometimes entirely herbaceous. Sepals oblong-lanceolate, obtuse, with rather broad membranous margins; the herbaceous part with numerous articulated hairs not terminating in glands, and not exceeding the point of the sepals; rarely glabrous. Petals a little longer than the sepals, oblong-oblanceolate, bifid, very rarely twice as long as the sepals. Fruit-stalks longer than the calyx, generally reflexed after flowering, afterwards erect. Capsule cylindrical-ovoid, exserted, about twice as long as the sepals, curved upwards, inclined so as to form an obtuse angle with the pedicel. Plant with articulated hairs not tipped with glands, rarely sub-glabrous.

Var. *α, genuina.*

Perennial. Flowers decandrous. Stem with simple hairs all round. Calyx pubescent.

Var. β, *holostoides*. Fries.

Perennial. Flowers decandrous. Stem pubescent in two opposite strips only, the pubescence changing places with the intervening glabrous strips at each internode. Calyx glabrous.

Var. γ, *pentandrum*.

Annual. Small, with the flowers pentandrous, and the capsule shorter than in var. α and β. Stem and calyx as in var. α.

In dry places, etc. Very common throughout Britain. Var. β I have only seen from near Newcastle. Var. γ principally on the seacoast.

Rootstock* usually present, slender, branched, producing barren shoots and flowering stems. Stems branched at the base, where they are decumbent, then erect or ascending, 3 to 15 inches high. Barren shoots 2 to 6 inches long, forming lax tufts, with leaves ½ to 1 inch long, narrowed at the base, and usually crowded together, especially towards the termination of the shoot. Stem-leaves (except the lowest) not narrowed at the base, shorter than those of the barren shoots, generally rather acute. Cyme lax, at least when in fruit. Sepals quite blunt, with few or none of the hairs terminated by glands, and those towards the apex not passing beyond the end of the sepal. Capsule usually long and curved, forming an obtuse angle with the pedicel. Whole plant (in var. α and γ) covered with white hairs not terminated by glands, colour deep dull-green. An alpine variety has the petals twice as long as the calyx; but of this I have seen no British specimens. Var. β is remarkable for being nearly glabrous. Var. γ is much like C. pumilum; but the absence of the gland-tipped hairs, and the blunt sepals, prevent its being confounded with that plant.

Mr. Bentham considers that C. tetrandrum, C. pumilum, C. semidecandrum, C. glomeratum, and C. triviale are only varieties of one species, to which he applies the name of C. vulgatum.

Narrow-leaved Mouse-ear Chickweed.

French, *Céraiste Trivial.* German, *Gemeines Hornkraut.*

SPECIES VII.—CERASTIUM ALPINUM. *Linn.*

PLATE CCXXIII.

Root perennial, rootstock producing numerous short procumbent barren shoots and sub-geniculate ascending and somewhat

* The term "rootstock" is applied here to that part of the base of the stem which is destitute of green leaves.

flexuous flowering stems. Leaves of the barren shoots varying from broadly oval-obovate to elliptical-oblanceolate, those of the flowering stem oval or elliptical. First pair of bracts smaller than the stem-leaves, ovate, generally with a narrow membranous margin; secondary bracts elliptical-lanceolate, very much shorter than the flowering pedicels, with distinct membranous margins, or sometimes almost entirely sub-membranous. Flowers few, 1 to 6. Sepals broadly-lanceolate, obtuse, with broad membranous margins; the herbaceous part with numerous rather long articulated simple hairs, and with or without shorter hairs terminated by glands; rarely glabrous. Petals twice as long as the calyx, obovate, bifid. Fruit-stalks much longer than the calyx, slightly spreading. Capsule cylindrical-ovoid, exserted, nearly twice as long as the sepals, slightly curved upwards, inclined so as to form an obtuse angle with the pedicel. Seeds reddish-brown, covered with acute tubercles, which are wrinkled at the base. Plant with short hairs tipped with glands, and more numerous and longer articulated white woolly hairs; rarely sub-glabrous.

Var. *α*, *lanatum*.

C. lanatum, *Lam.* *Reich.* Ic. Fl. Germ. et Helv. Vol. VI. *Caryoph.* Tab. CCXXXII. Fig. 4976.

Plant with numerous long woolly hairs.

Var. *β*, *pubescens*.

C. alpinum ?, *Reich.* Ic. Fl. Germ. et Helv. Vol. VI. *Caryoph.* Tab. CCXXXII. Fig. 4977.

C. alpinum, var. hirsutum, *Gr. & Godr.* ? Fl. de France, Vol. I. p. 271.

Plant with short hairs.

On rocks on high mountains. Rather local. Most common on mica-slate rocks in Scotland,—as on the Breadalbane and Clova mountains; but it has also occurred on Snowdon, Carnarvonshire; Helvellyn, Cumberland; and is found on most of the higher Scottish mountains as far North as Sutherlandshire or perhaps Orkney.

England, Scotland. Perennial. Summer and Autumn.

Barren shoots short, 1 to 2 inches long. Flowering stems 3 to 6 inches high, decumbent at the base, and bent at the lower nodes. Leaves of the barren shoots and those on the lower part of the stem generally but not always narrowed at the base, $\frac{3}{8}$ to $\frac{1}{2}$ inch long; other stem-leaves generally broadly-elliptical, $\frac{1}{2}$ to $\frac{3}{4}$ inch long, all obtuse or acute. First pair of bracts not half the size of the stem-leaves. Peduncles very long, having often small secondary

bracts about the middle. Flowers handsome, white, $\frac{3}{4}$ to 1 inch across or more. Capsule usually with about one-third of its length projecting beyond the sepals, but sometimes a little longer or a little shorter. Seeds about $\frac{1}{20}$ inch across, closely covered with prominent rather acute tubercles, which are puckered all round at the base. Plant growing in tufts, with the barren stems forming a compact mat, clothed with white soft hairs in addition to the short gland-tipped ones, the proportion of the two being variable, the former very numerous in var. α so that the plant appears quite white.

A glabrous variety occurs in Scandinavia and in Switzerland, but of this I have seen no British specimens. I quote Reichenbach's figure of C. alpinum with some doubt, as it has more the mode of growth and habit of C. latifolium of British and Scandinavian authors.

Hairy Alpine Chickweed.

French, *Céraiste des Alpes.* German, *Alpen Hornkraut.*

SPECIES VIII.—CERASTIUM LATIFOLIUM. *Smith.*

PLATE CCXXIV.

Root perennial. Rootstock producing very numerous ascending barren shoots, and somewhat flexuous ascending flowering stems. Leaves of the barren shoots oblanceolate or obovate, those of the flowering stems elliptical or roundish-oval. First pair of bracts not much smaller than the stem-leaves, ovate-lanceolate or elliptical, entirely herbaceous; secondary bracts rarely present, elliptical, very much shorter than the flowering pedicels, entirely herbaceous, or sometimes with a very narrow membranous margin. Flowers generally solitary, and rarely more than 2. Sepals ovate-lanceolate or oval-ovate, obtuse, with broad membranous margins; the herbaceous part with numerous short articulated hairs and still shorter ones tipped with glands, sometimes the one kind and sometimes the other predominating. Petals twice as long as the sepals, obovate, bifid. Fruit-stalks longer than the calyx, slightly spreading. Capsule conical-ovoid, exserted, about one-fourth longer than the sepals, nearly straight, and in an almost continuous straight line with the pedicel. Seeds pale reddish-brown, with, round the margins of the faces, rather distant slightly-elevated elongated tubercles or short ridges, which are slightly puckered at the sides; seed-coat adhering rather loosely to the seed. Plant with short gland-tipped hairs and slightly longer yellowish stiff articulated hairs.

Var. α, *Smithii*.

C. latifolium, *Sm.* Eng. Bot. No. 473.
C. alpinum, var. piloso-pubescens, *Benth.* Lind. Syn. Brit. Fl. p. 51.

Plant growing in loose tufts, with elongated flowering stems. Leaves at the base of the stem not crowded, oblanceolate. Stem-leaves elliptical or oval. Sepals ovate-lanceolate, with articulated hairs and few or no gland-tipped ones. Stem with numerous articulated hairs intermixed with short gland-tipped ones. Plant yellowish-green.

Var. β, *compactum*.

C. latifolium, Auct. Scand.

Plant densely tufted. Flowering stems very short. Leaves at the base of the stem not crowded, oblanceolate. Stem-leaves elliptical. Sepals ovate-lanceolate, and as well as the stem clothed with articulated hairs and shorter gland-tipped ones. Plant light green.

Var. γ, *nigrescens*.

C. nigrescens, *Edmonston MSS.*
C. latifolium, *Edmonston*, in Phytologist, Ser. i. Vol. I. p. 498.
C. latifolium, var. Edmonstonii, *Bab.* Man. Brit. Bot. ed. v. p. 37.

"Plant growing in dense tufts." Lowest leaves crowded, obovate; stem-leaves roundish or oval. Sepals broadly oval-ovate, and as well as the stem clothed with gland-tipped hairs, but without longer articulated ones. Plant deep green, often tinged with brownish-purple.

On rocks or mountains. Rare. Var. α on Snowdon, Carnarvonshire; Ben Lawers, Perthshire; Ben Lomond, Stirlingshire; Ben Hope, Sutherlandshire, &c. Var. β, on the granitic mountains on the confines of Aberdeenshire and Moray, Braemar. Var. γ, on loose serpentine gravel near Baltasound, Unst, Shetland.

England, Scotland. Perennial. Summer and Autumn.

Var. α very similar to C. alpinum, but growing in looser and more straggling tufts from the barren stems being longer; it is, moreover, a much greener plant, and the pubescence is shorter and more rigid. The flowers are very similar, and the upper and secondary bracts are entirely (or almost entirely) herbaceous. The seeds (as in var. β and γ) about $\frac{1}{16}$ inch across, rugose, without sharp-pointed tubercles, and with the seed-coat fitting less closely to the seed.

Var β is much more densely tufted, the barren stems being very

numerous and short, and it has the flowering stems less elongated at the base than in var. α.

Var. γ, at least, is probably a distinct sub-species, as it retains its short broad leaves and sepals when cultivated.

It is very doubtful if any of these be the C. latifolium of Linnæus. The plant usually so named by the botanists of the Continent (except those of Scandinavia) is that which Dr. Walker Arnott names C. glaciale (Gaud.); though this name seems to belong only to the small state found at the highest elevations on the Alps. This Continental plant (C. latifolium, Reich. Ic. Fl. Germ. et Helv. Vol. VI. Tab. CCXXXI. Fig. 4975) has broadly-elliptical leaves tapering at each end, and much thicker in texture, the whole plant more closely covered with a stiff pubescence of spreading hairs; the seeds twice as large as in the British C. latifolium, dark brown; and the barren shoots are very few and straggling, but in other respects similar to those of C. latifolium of British authors.

C. latifolium of Scandinavian authors (judging from specimens received from the late Professor Blytt) is precisely the same as var. β described above, which Mr. Backhouse accordingly takes as the type, and considers our var. α as a distinct species. The seeds of both these forms, however, are quite alike, and so are those of the remarkable form from Shetland. I suspect that Reichenbach's figure of C. alpinum, quoted above with a mark of doubt under C. alpinum var. β, may really represent Smith's C. latifolium.

Broad-leaved Alpine Chickweed.

French, *Céraiste à Larges Feuilles.*

SPECIES IX.—CERASTIUM ARVENSE. *Linn.*

PLATE CCXXV.

Reich. Ic. Fl. Germ. et Helv. Vol. VI. *Caryoph.* Tab. CCXXXIV. CCXXXV. Figs. 4980, 4981, 4982.

Root perennial. Rootstock much branched, producing numerous prostrate and generally much elongated barren shoots and erect or ascending nearly straight flowering stems. Leaves of the barren shoots varying from oblanceolate to narrowly strap-shaped, attenuated at the base; those of the flowering stems varying from elliptical to narrowly linear-lanceolate. First pair of bracts very much smaller than the stem-leaves, lanceolate, with rather narrow membranous margins; secondary bracts very much shorter than the flowering pedicels, with broad membranous margins. Flowers generally numerous. Sepals oblong-lanceolate, rather obtuse, with broad membranous margins, the herbaceous part with numerous very short gland-tipped hairs, or sometimes longer articulated hairs

not tipped by glands, sometimes the one kind and sometimes the other predominating. Petals twice as long as the sepals, obovate, bifid. Fruit-stalks much longer than the calyx, sub-erect, curved outwards at the very tip. Capsule ovoid-cylindrical, usually about equal to the calyx, or at least not more than one-fourth longer. Seeds pale reddish-brown, covered with close concentric rings of small prominent smooth tubercles. Stem clothed with short gland-tipped hairs and longer reflexed articulated ones without glands. Leaves more or less hairy, or rarely sub-glabrous.

Var. α, *pubescens.*

Whole plant pubescent, with the leaves rather soft. Cymes from 3- to 10-flowered.

Var. β, *Andrewsii.*

Leaves sub-glabrous, ciliated, rigid, somewhat recurved, with the midrib very strong and prominent. Cymes usually reduced to a single shortly-stalked flower.

On dry banks. Var. α rather common, especially in the East of England. More rare in Scotland, although it is found as far North as the counties Elgin and Nairn. Var. β, Great Arran Island, Ireland.

England, Scotland, Ireland. Perennial. Spring and Summer.

Plant much branched, growing in large tufts, the barren shoots procumbent and rooting, 3 inches to 1 foot long. Flowering stems numerous, rather stiff and straight, 3 inches to 1 foot high. Leaves ½ to ¾ inch long, generally narrowly oblong or strap-shaped; the lower ones attenuated below, and the upper ones towards the point. Flowers ½ to ¾ inch across, white, in very lax dichotomous cymes. Capsule most frequently not exceeding the calyx (particularly in the few-flowered states), but in the larger examples it is frequently exserted. Plant light or deep green. Var. α often greyish from the abundance of hairs, and slightly viscid.

Var. β is a curious form, with rigid squarrose crowded leaves and very short peduncles; it is much more glabrous than the ordinary states, and though the calyx and stem are both slightly hairy, yet the hairs are very short, and on the latter reflexed; the leaves have merely a few hairs on the margin towards the base. This form has usually been referred to C. strictum (Linn.), but it appears to agree better in its reflexed rigid leaves with his C. suffruticosum, which is the same as C. laricifolium (Vill.). It seems to be connected with the typical form by all intermediate states.

Field Chickweed.

French, *Céraiste des Champs.* German, *Acker Hornkraut.*

Section III.—DICHODON.

Sepals not acuminated. Petals obovate, deeply bifid. Stamens 10. Styles generally 3 (more rarely 4 or 5). Capsule generally exserted, straight, opening at the apex by twice as many erect or spreading teeth as there are styles.

Species X.—CERASTIUM TRIGYNUM. *Vill.*

Plate CCXXVI.

Dichodon cerastoides, *Reich.* Ic. Fl. Germ. et Helv. Vol. V. *Cerasph.* Tab. CCXXI. Fig. 4915.

Stellaria cerastoides, *Linn.* *Sm.* Eng. Bot. No. 911. *Koch*, Syn. Fl. Germ. et Helv. ed. ii. p. 129.

Root perennial. Rootstock much branched, producing numerous very slender prostrate slightly-elongated barren shoots and decumbent or ascending flowering stems. Leaves of the barren shoots oblanceolate or elliptical-linear; those of the flowering shoots generally broader. First pair of bracts not much smaller than the stem-leaves, narrowly-lanceolate, entirely herbaceous; secondary bracts very much shorter than the flowering pedicels, broadly-lanceolate, entirely herbaceous. Flowers of the cyme generally few, frequently reduced to 1. Sepals lanceolate, obtuse, with broad scarious margins, the herbaceous part with a few short gland-tipped hairs, or occasionally glabrous. Petals twice as long as the sepals, obovate, bifid. Fruit-stalks much longer than the calyx, erect. Capsule ovate-ovoid, straight, nearly twice as long as the calyx. Seeds yellowish-brown, covered with small very acute tubercles. Stem glabrous, or with short gland-tipped pubescence, especially towards the top; leaves quite glabrous.

On damp rocks on high mountains. Rare. Ben Lawers, in Perthshire; Ben Nevis and Red Cairn, Inverness-shire; Cairn Gorum, Cairn Towl, Ben Macdhui, Ben-na-bourd, Braemar, Aberdeenshire. In the "British Flora" it is said to occur near Bantry, Ireland; but I know not on what authority.

England, Ireland ?. Perennial. Summer and Autumn.

Somewhat creeping, growing in loose straggling tufts, with the stems bare of leaves at the base; the barren shoots 2 to 6 inches long, with rather distant leaves. Flowering stems 2 to 4 inches high, with the leaves often falcate and sub-secund. Flowers about ½ inch across, white. Sepals more spreading while in flower than in

any of the preceding species, and with a stronger mid-nerve. Plant quite green, with the leaves somewhat fleshy, and bearing some resemblance to those of Montia fontana, rarely somewhat hairy; the upper part of the stem often clothed with very short hairs, slightly viscid. Styles usually 3. (I have seen 5, and Smith mentions having met with 4.) Capsule from one-fourth to one-half longer than the calyx, with twice as many teeth as there are styles.

Three-styled Alpine Chickweed.

GENUS VIII.—STELLARIA.

Sepals 5 (rarely 4), somewhat spreading. Petals 5 (rarely 4), bipartite or deeply bifid, occasionally abortive. Stamens 10 (but sometimes fewer), hypogynous or perigynous. Styles 3 (rarely 5, 4, or 2). Capsule generally about equal in length to the sepals, ovoid, straight, 1-celled, opening at the apex by 6 equal valves in the species with 3 styles, or by 5 bifid teeth in those which have 5; valves separating half-way down or more, erect or recurved. Seeds numerous, rough, globose-reniform, more or less compressed laterally.

Herbs, often diffusely branched, glabrous or slightly pubescent. Leaves ovate, flaccid; or narrowly lanceolate, or elliptical and stiffer. Flowers white, arranged in dichotomous cymes, which are commonly terminal and sometimes branched in a paniculate manner; or rarely sub-solitary.

The name Stellaria is derived from the word *stella*, a star, in allusion to the star-like arrangement of the petals.

Sub-Genus I.—MALACHIUM. *Fries.*

Styles 5. Capsule opening by 5 valves, each of which is bifid at the apex.

SPECIES I.—STELLARIA AQUATICA. *Scop.*

Plate CCXXVII.

Malachium aquaticum, *Reich.* Ic. Fl. Germ. et Helv. Vol. VI. *Caryoph.* Tab. CCXXXVII. Fig. 4967.

M. aquaticum, *Fries*, et *Auct. Plur.*

Stellaria pentagyna, *Gaud.* Fl. Helv. Vol. III. p. 179.

Cerastium aquaticum, *Linn.* *Sm.* Eng. Bot. No. 538.

Larbræa aquatica, Ser. in *D. C.* Prod. Vol. I. p. 395 (*non* St. Hil.).

Stem diffusely branched, decumbent. Flowering stems branched below the cyme. Leaves ovate, acute or acuminate; the lower ones on footstalks shorter than the laminæ, the middle and upper

ones sessile. Flowers numerous, in dichotomous cymes terminating the stem and branches. Sepals lanceolate, rather obtuse, faintly 1-nerved, with broad scarious margins, the herbaceous part with short gland-tipped hairs. Fruit-stalks spreading or reflexed. Capsule drooping, longer than the sepals, ovate-conical. Stem with short gland-tipped hairs.

By the borders of rivers and ditches, and in damp hedges and thickets. Rather uncommon. Pretty widely distributed in England as far North as Yorkshire and Cheshire, but not known to occur in Scotland.

England. Perennial. Summer and Autumn.

Stems much branched, very brittle, decumbent or supporting themselves on bushes and other neighbouring objects, 1 to 3 feet long, with numerous shorter barren shoots at the base. Leaves of the barren shoots and lower part of the stem generally stalked, broadly ovate, truncate or inclining to heart-shaped at the base; those on the flowering stem (except the lowest) sessile, oval or ovate. Flowers white, about $\frac{1}{2}$ inch across, very numerous, in regular dichotomous cymes terminating the stem and branches, the whole forming an irregular panicle. Sepals lanceolate, rather obtuse. Petals longer than the sepals, bipartite, with narrowly oblong diverging lobes. Stamens 10. Fruit pedicels much longer than the sepals, at first slightly reflexed after flowering, at length spreading horizontally and hooked downwards at the end. Capsule about one-third or one-fourth longer than the calyx, broadly ovate-ovoid, conical towards the apex, which splits into 5 valves reaching to about the middle of the capsule, each valve divided for a short way down into 2 lobes. Seeds pale orange-brown, rugose, with vesicular papillæ. Whole plant light yellowish-green, viscous, clothed with short gland-tipped hairs.

This plant bears much resemblance to Stellaria nemorum, and to the large forms of S. media: from the former it may be distinguished by its smaller flowers, decumbent diffusely-branched stem, shorter barren shoots, and by having more of the leaves sessile; from the latter it can be known by its larger flowers, stamens always 10, and by the stem being hairy all round; from both by the absence of articulated hairs, and by the profusion of gland-tipped ones on its stem, as well as by the larger capsule with 5 styles, and opening by 5 bifid valves.

Water Chickweed.

French, *Stellaire Aquatique.* German, *Wasser-Weichling.*

Sub-Genus II.—EU-STELLARIA. *Fenzl.*

Styles 3. Capsule opening by 6 equal entire valves.

SECTION I.—PETIOLARES. *Fenzl.*

Leaves ovate or elliptical, sub-cordate, the lower ones stalked.

SPECIES II.—STELLARIA NEMORUM. *Linn.*

PLATE CCXXVIII.

Reich. Ic. Fl. Germ. et Helv. Vol. V. *Caryoph.* Tab. CCXXII. Fig. 4906.

Rootstock creeping, terminating in erect simple flowering stems with long erect barren shoots at the base. Lower leaves and those of the barren shoots ovate, slightly cordate at the base, with footstalks frequently as long as the laminæ; uppermost leaves ovate-acuminate, sessile. Flowers numerous, in terminal dichotomous cymes. Sepals broadly lanceolate, obtuse, obscurely 3-nerved, with narrow scarious margins, the herbaceous part with a few articulated hairs towards the base. Petals twice as long as the calyx. Stamens 10. Fruit-stalks spreading or reflexed. Capsule drooping, about as long as the sepals, oblong-ovoid. Stem with articulated hairs, and sometimes a few shorter gland-tipped ones intermixed.

In woods and shady places. Not very common. Most abundant in the North of England and in the South of Scotland, extending, however, from Devon and Cornwall to Dumbarton and Moray, but quite absent from the South-East of England and extreme North of Scotland.

Stems fragile, 1 to 2 feet high, terminating in a single dichotomous cyme, without others developed from branches in the axils of the stem-leaves. Barren shoots 6 inches to 1 foot long. Leaves broadly oval, acuminate. Flowers white, $\frac{5}{8}$ to $\frac{3}{4}$ inch across, with the petals bipartite, with narrow slightly-diverging lobes. Seeds orange-brown, rugose, with small vesicular papillæ. Plant pale green, with soft articulated hairs, occasionally intermixed with a very few shorter gland-tipped ones.

Wood Chickweed, or Wood Stitchwort.

French, *Stellaire des Bois.* German, *Hain-Vogelkraut.*

SPECIES III.—STELLARIA MEDIA. *With.*

PLATE CCXXIX.

Alsine media, *Linn.* Sp. Pl. p. 389.

Root annual, producing diffusely-branched decumbent or ascending stems. Lower leaves ovate, with footstalks frequently

as long as the laminæ; upper leaves ovate or broadly elliptical, sessile. Flowers numerous, in terminal dichotomous cymes. Sepals lanceolate, with narrow scarious margins, the herbaceous part with articulated hairs, some of them terminating in small glands, rarely glabrous. Petals as long as, or shorter than, the calyx, sometimes abortive. Stamens variable in number, but often fewer than 10. Fruit-stalks spreading or reflexed. Capsule slightly drooping, a little longer than the sepals, conic-ovoid. Stem with articulated hairs in a narrow strip down one side.

Var. α, *genuina.*

S. media, "*Sm.*" *Reich.* Ic. Fl. Germ. et Helv. Vol. V. *Caryoph.* Tab. CCXXII. Fig. 4904.

S. media, *Boreau,* Fl. du Centre de la Fr. ed. iii. Vol. II. p. 104.

Stem much branched, decumbent. Leaves acute, or very shortly acuminated. Pedicels hairy on one side. Sepals lanceolate, scarcely acute, hairy. Petals a little shorter than the sepals. Stamens usually 5. Seeds about $\frac{1}{20}$ inch across, yellowish-brown, punctate-rugose, with rather distant slightly-raised rounded tubercles, which are puckered at the base.

Var. β, *Boræana.*

S. Boræana, *Jord.* Pug. Pl. Nov. p. 33. *Boreau,* Fl. du Centre de la Fr. ed. iii. Vol. II. p. 104.

Stems slender, slightly branched. Leaves and pedicels as in var. α. Sepals lanceolate, somewhat obtuse, hairy. Petals none. Stamens usually 3. Seeds half the size of those of var. α, indistinctly punctate-rugose, with distant slightly-raised tubercles of an irregular form.

Var. γ, *neglecta.*

S. neglecta, *Wëihe.* *Reich.* Ic. Fl. Germ. et Helv. Vol. V. *Caryoph.* Tab. CCXXII. Fig. 4905.

Boreau, Fl. du Centre de la Fr. ed. iii. Vol. II. p. 104.

Stem sub-erect, branched at the base. Leaves acute. Pedicels hairy on one side. Sepals broadly lanceolate, rather obtuse, hairy. Petals as long as the sepals. Stamens generally 10. Seeds reddish-brown, about the size of those of var. α, punctate-rugose, with numerous rather prominent rounded tubercles, which are irregularly puckered at the base.

? Var δ, *umbrosa*.

S. umbrosa, "Opitz." teste *Bab.* Man. Brit. Bot. ed. v. p. 54.
S. grandiflora, "*Tenore.*" *Woods*, in *Hook.* Comp. to Bot. Mag. Vol. II. p. 264.
S. Elizabethæ, "*F. Schultz*," Newbould.

Stem slender, erect or ascending. Pedicels almost glabrous. Leaves sometimes attenuated at the base, and generally much acuminated at the apex. Flowering peduncles long. Sepals lanceolate-acute, glabrous, with small raised points. Seeds fuscous, closely covered with prominent acute tubercles, which are star-shaped at the base.

In cultivated ground, waste places, and hedgebanks. Var. α very common throughout Britain. Var. β on sandy ground, Isle of Wight and Yorkshire; probably elsewhere on poor soil. Var. γ, Isle of Wight and Yorkshire; probably frequent. Var. δ, rare; Hendle Wood, near Lewes, Sussex; Mr. Newbould also tells me he has seen it in Dorset, West Somerset, and Yorkshire.

England, Scotland, Ireland. Annual. Spring to Autumn.

A very variable plant, with stems 3 inches to 3 feet long. Leaves generally glabrous, also variable in size and shape. The hairy stripe on the stem seems to be always present, but in var. δ it is very faint. Flowers from $\frac{3}{16}$ to $\frac{3}{8}$ inch across, varying in the number of stamens, the length of the styles, and the size and sculpture of the seeds. Pedicels reflexed after flowering, but ascending when the fruit is ripe.

Var. β looks more like a starved state than a true variety.

Var. γ has much the habit of Stellaria nemorum, but does not appear to me entitled to rank as a sub-species, which, however, can only be determined by continued cultivation.

Var. δ is most probably a sub-species, as the seeds are different in colour and sculpture from those of varieties α, β, and γ. It has the tubercles of the seeds closer, more acute, and the puckering is regular, and makes the base starlike; the long slender peduncles and more acute sepals give the plant a very different appearance, but the shape of the leaves appears to be inconstant, judging from a fine series collected by Dr. J. A. Power, to whom I am indebted for specimens. Possibly this form is a perennial, as some of Dr. Power's specimens have barren shoots.

Common Chickweed, Stitchwort.

French, *Stellaire Morgeline.* German, *Gemeines Vogelkraut.*

This well-known little plant is common on every bit of waste and uncultivated ground throughout the world, and is found in every field and garden. When boiled, it forms an excellent green vegetable resembling spinach in flavour, and is very wholesome. Growing as it does at all seasons of the year, and very rapidly, it might well supply a want, sometimes severely felt amongst the poor, of a variety of vegetable food. But so great are the prejudices against any innovations in diet, that the most valuable articles of food are frequently thrown away and destroyed as useless by those to whom they might be of the utmost benefit. It is a favourite food with small birds and young chickens; and the fact that it produces not less than seven or eight successive crops in the year, renders the supply amply sufficient for their wants. The old herbalists considered Chickweed "cooling in virtue and operation." Gerarde says: "The leaves boiled in vinegar and salt are good against manginesse of the hands and legs, if they be bathed therewith. Little birds in cages, especially linnets, are refreshed with the Lesser Chickweed when they loath their meat, whereupon it was called of some Passerina." Chickweed was also made into a paste with barley-meal and water for inflammations of the eyes; the juice was poured into the ears "agaynst the pain of them." "As a poultice and a remedy for all inflammations," Chickweed had at one time a great reputation also as a vulnerary. Its virtues are, however, entirely imaginary. Dr. Withering observes that it is an instance of what is called the "sleep of plants;" for every night the leaves approach in pairs, so as to include within their upper surfaces the tender rudiments of the new shoots; and those of the uppermost pair but one at the end of the stalk are furnished with longer leaf-stalks than the others, so that they can close upon the terminal pair and protect the end of the branch. This curious phenomenon is doubtless intended to secure from injury the delicate organs of fructification. Galen writes: "The seed of the Stitchwort is sharpe and biting to him that tastes it, and to him that useth it is very like to mill." Old writers say: "They are wont to drinke it in wine with the powder of acornes against the paine in the side, stitches, and such like." Hence we suppose the common name has arisen. In old English this plant is also called the "Hen's Inheritance."

Section II.—HOLOSTEÆ. *Fenzl.*

Leaves rather rigid, sessile, connate at the base, narrowly linear-lanceolate, tapering to the apex. Flowers large. Stamens hypogynous, on a very slightly-developed disk. Capsule globular, inflated.

Species IV.—STELLARIA HOLOSTEA. *Linn.*

Plate CCXXX.

Reich. Ic. Fl. Germ. et Helv. Vol. V. *Caryoph.* Tab. CCXXIII. Fig. 4908.

Rootstock perennial, with barren shoots. Stem erect. Leaves all sessile, linear-lanceolate, very acute; the lower ones crowded and reflexed. Flowers in a dichotomous cyme, with herbaceous bracts resembling the leaves. Sepals lanceolate-acute, with very narrow scarious margins, very indistinctly 3-nerved. Petals usually much longer than the sepals, divided to the middle into 2 rather

broad approximate lobes. Capsule globular, inflated, as long as the calyx. Plant glabrous, with the margins of the leaves rough, and the upper part of the stem hairy.

In grassy places in woods, thickets, and hedge-banks, also on rocks on mountains. Very common throughout Britain.

England, Scotland, Ireland. Perennial. Spring and Early Summer.

Stem decumbent at the base, then erect, 1 to 2 feet high, stiff, and breaking readily at the joints. Barren shoots decumbent or ascending, much shorter than the flowering stems. Leaves 1½ to 4 inches long by ¼ to ½ inch broad, stiff, somewhat grass-like. Bracts similar to the leaves, but smaller. Flowers white, ½ to ¾ inch across, generally rather few, on long pedicels. Seeds tuberculate. Plant deep green, very slightly glaucous, with very short stiff hairs on the edges and midrib of the leaves, and others rather softer on the angles of the upper part of the stem.

A monstrosity of this species has occurred at Pontypool, and also in the Isle of Wight: in this form the petals are shorter and laciniate.

Greater Stitchwort.

French, *Stellaire Holostée.* German, *Grossblumiges Vogelkraut.*

This pretty plant is worth the trouble of cultivation, and forms a very elegant border flower. In old English it is called "Adder's Meat," or "All Bones."

SECTION III.—LARBREA. *Fenz.* (non *St. Hil.* nec *Ser.*).

Leaves sessile, varying from linear-strapshaped to ovate. Flowers usually rather small. Stamens inserted on a perigynous disk or ring, which adheres to the calyx. Capsule ovoid, oblong, or turbinate.

SPECIES V.—STELLARIA GLAUCA. *With.*

PLATE CCXXXI.

Reich. Ic. Fl. Germ. et Helv. Vol. V. *Caryoph.* Tab. CCXXIII. Fig. 4909.

Rootstock creeping, with barren shoots. Stem erect, with alternate branches especially near the base. Leaves all sessile, linear-elliptical or strap-shaped, attenuated at each end, all ascending. Flowers in an irregular few-flowered terminal dichotomous cyme, or solitary and axillary. Bracts linear-lanceolate, membranous, with an herbaceous strip in the middle. Sepals lanceolate, acute with broadly membranous margins, rather indistinctly 3-veined. Petals longer than the sepals (often twice as long), bipartite, with

oblong approximate lobes. Fruit-pedicels spreading, not reflexed after flowering. Capsule oblong-ovoid, about equal to the sepals. Plant entirely glaucous and glabrous.

In marshy places. Rather rare, though it occurs in a good many of the English counties, and in Scotland as far North as the neighbourhood of Glasgow and Edinburgh.

England, Scotland, Ireland. Perennial. Summer.

Stems slender, 1 to 2 feet high, very brittle, erect, branched in an irregularly forked manner, with the leaves $\frac{3}{4}$ to 2 inches long. Barren shoots slender, remote. Flowers in a terminal few-flowered cyme, with others terminating branches from the axils of the leaves (these axillary cymes are frequently reduced to a single flower). Flowers $\frac{1}{2}$ to $\frac{3}{4}$ inch across, white. Sepals much more distinctly veined and more broadly membranous at the margins than in S. Holostea, from which the mode of branching and inflorescence, as well as the more glaucous colour and the curvilinear margins of the leaves, distinguish it at a glance. The membranous bracts and perfect freedom from hairs or roughness are equally constant but less striking characters.

Glaucous Marsh Stitchwort.

French, *Stellaire Glauque.* German, *Meergrünes Vogelkraut.*

SPECIES VI.—STELLARIA GRAMINEA. *Linn.*

PLATE CCXXXII.

Reich. Ic. Fl. Germ. et Helv. Vol. V. *Caryoph.* Tab. CCXXIV. Fig. 4911.

Rootstock creeping, with numerous barren shoots. Stem diffuse, decumbent or ascending. Leaves all sessile, narrowly elliptical or strapshaped-lanceolate. Flowers generally numerous, in a terminal irregularly dichotomous cyme. Bracts small, oblong, acuminate, scarious, with an herbaceous central line. Sepals ovate-lanceolate, acute, strongly 3-nerved. Petals equalling or a little exceeding the sepals, bipartite. Fruit pedicels reflexed after flowering, afterwards spreading. Capsule nodding, elliptical-ovoid, a little longer than the sepals. Plant glabrous, not glaucous, with the margins of the bracts and those of the base of the leaves ciliated.

In meadows, hedges, and amongst bushes, especially on gravelly soils. Very common throughout the whole of Britain.

England, Scotland, Ireland. Perennial. Summer.

Stems 1 to 3 feet high, brittle, decumbent at the base, then ascending. Leaves much resembling those of S. glauca, but usually

broader and with the margins generally ciliated at the base, and with the colour far less glaucous. Flowers much more numerous, in a dichotomous cyme, with falsely paniculate branches, from $\frac{1}{4}$ to $\frac{1}{2}$ inch across, or even more. Sepals much more strongly 3-ribbed than in S. glauca. Seeds sub-globular, slightly depressed, dark brown, with lengthened ridges presenting somewhat the appearance of the surface of the human brain.

Stellaria scapigera (Willd.), which is said to have been found by Don by the sides of rivulets between Dalwhinnie Inn and the old Kirk of Laggan, Perthshire, and by Loch Nevis, Inverness-shire, is apparently a monstrosity of S. graminea, and probably from Don's garden; some plant he met with being mistaken by him for the same as the one he had in cultivation. Like many other abnormal forms, it appears to be constant under cultivation.

Lesser Stitchwort.

French, *Stellaire Grammée.* German, *Grassblättriges Vogelkraut.*

SPECIES VII.—STELLARIA ULIGINOSA. *Murray.*

PLATE CCXXXIII.

Larbrea uliginosa, *Reich.* Ic. Fl. Germ. et Helv. Vol. V. *Caryoph.* Tab. CCXXVI. Fig. 3669.

L. aquatica, *St. Hil.* in *D. C.* Prod. Vol. III. p. 666 (non *Seringe*).

Root annual. Stem decumbent, much branched. Leaves sessile, oblong-lanceolate or narrowly elliptical, attenuated at each end. Flowers few, in small dichotomous cymes, which are sometimes terminal, but more commonly lateral, or both terminal and lateral. Bracts lanceolate, nearly entirely membranous. Sepals linear-lanceolate, acute, with 1 distinct and 2 faint nerves. Petals bipartite, considerably shorter than the sepals. Fruit pedicels spreading, appearing enlarged at the tip, from the sepals being united at the base. Capsule ovoid, a little longer than the sepals. Plant glaucous and glabrous, with only the bases of the leaves ciliated, but even these are often without marginal hairs.

In marshes and ditches. Very common throughout the whole of Britain, both in low ground and by rills on high mountains.

England, Scotland, Ireland. Annual. Summer.

Stems numerous, from 6 to 18 inches long, or even more, brittle and succulent, weak. Leaves flaccid, numerous, ascending; the lower ones rather obtuse; the middle and upper ones acute; all with a small callous point. Cymes generally pseudo-axillary, few-flowered, most commonly sessile, sometimes reduced to solitary flowers. Flowers $\frac{1}{4}$ inch across, white. Sepals very narrow, united

below into a short funnel-shaped tube. Petals inserted on a perigynous ring with the stamens. Seeds very minute, reddish brown, rugose, with faint elevated ridges. Plant somewhat succulent, very pale glaucous green, quite glabrous except a few hairs at the base of the leaf.

This plant belongs to the genus Larbrea, as defined by St. Hilaire. It is distinguished by the base of the calyx being a short funnel, formed by the union of the sepals, as it is usually called: it is, however, more probable that the funnel is the excavated apex of the peduncle, or rather an excavated torus, as in the genus Escholtzia.

"When growing on dry ground, as it may occasionally be seen upon banks of earth thrown up in clearing out watercourses," Mr. H. C. Watson observes that "this species forms a sort of tuft with very numerous branches; and it then assumes very much the semblance to a Paronychia" (Cyb. Brit. Vol. I. p. 225).

Bog or Fountain Stitchwort.

German, *Sumpf Vogelkraut.*

GENUS IX.—ARENARIA. *Linn.*

Sepals 5, somewhat spreading in flower. Petals 5, entire and very obscurely emarginate. Stamens 10 (more rarely only 5 or 8). Styles usually 3 (more rarely 4). Capsule about as long as the sepals, ovoid, straight, dry, 1-celled, opening at the apex by twice as many teeth or valves as there are styles. Seeds numerous, shagreened, and destitute of a strophiole, or smooth and with a strophiole.

Small annual or perennial herbs, often procumbent and diffusely branched, glabrous or pubescent. Leaves small, ovate or elliptical in the British species, but linear in some foreign ones. Flowers white, in dichotomous cymes, which are sometimes reduced to solitary flowers.

The generic name comes from the word *arena*, sand, on which many of the plants are found.

Section I.—MŒHRINGIA. *Fenzl.*

Sepals 4 or 5. Petals 4 or 5. Stamens 8 or 10 (more rarely 5). Styles 2 or 3 (rarely 4). Capsule opening by twice as many recurved valves as there are styles. Seeds nearly smooth, shining, with a strophiole at the hilum.

SPECIES I.—ARENARIA TRINERVIS. *Linn.*

PLATE CCXXXIV.

Möhringia trinervia, *Clairv.* *Reich.* Ic. Fl. Germ. et Helv. Vol. V. *Caryoph.* Tab. CCXVI. Fig. 4943.

M. trivernis, *Clairv.* et *Auct. Plur.*

Root annual. Stems numerous, weak, diffusely branched at the base, spreading or ascending. Leaves ovate-oval or oval, acute, 3- (or more rarely 5-) nerved, very thin in texture; the lower ones with stalks about as long as the laminæ; the upper ones sub-sessile. Flowers numerous, in dichotomous cymes terminating the stem and branches, with leaf-like bracts. Pedicels very long, spreading and curved downwards at the apex after flowering. Sepals 5, lanceolate or ovate-lanceolate, acuminate, with 3 nerves down the middle, the central one hairy and stronger than the glabrous lateral ones; margins broadly membranous and ciliated. Petals oblanceolate, two-thirds the length of the sepals. Capsule shorter than the calyx, opening by revolute valves. Seeds black, roundish-reniform, smooth and shining, with a small strophiole in the indentation. Plant pubescent, with short hairs, but frequently glabrous below; margins of the leaves ciliated.

In damp woods, thickets, and hedgebanks. Not uncommon. Most abundant in England and the South of Scotland, but not extending to the extreme North of the latter country.

England, Scotland, Ireland. Annual. Spring and Early Summer.

Root very slender. Stem subdividing near the crown of the root into very numerous equal branches from 3 to 18 inches long. Leaves $\frac{1}{4}$ to 1 inch long, those in the middle part of the stem the largest. Flowers about $\frac{1}{4}$ inch across or less, white. Peduncles $\frac{3}{4}$ to $1\frac{1}{4}$ inch long when full grown. Plant light green, with somewhat the habit of Stellaria media, the common Chickweed.

A small pentandrous form has been found in Braemar by Mr. Croall; this, however, is not Möhringia pentandra (Gay), a South European plant, with the leaves and sepals not ciliated, the latter 1-nerved, the stamens shorter, the capsule longer, and the seeds with minute raised points. Dr. Walker Arnott remarks, with good reason, that "these two plants accord ill with the other species placed in Möhringia" (Brit. Fl. ed. viii. p. 68).

Three-nerved Sandwort.

French, *Sabline Trinervée.* German, *Dreinervige Sandkraut.*

Section II.—EUTHALIA. *Fenzl.*

Sepals 5, not indurated at the base. Petals 5. Stamens 10. Styles 3 (rarely 4 or 5). Capsule opening by twice as many teeth or valves as there are styles. Seeds globose or lenticular, generally rough, shining, destitute of a strophiole.

SPECIES II.—ARENARIA SERPYLLIFOLIA. *Linn.*

Plates CCXXXV. CCXXXVI.

Reich. Ic. Fl. Germ. et Helv. Vol. V. *Caryoph.* Tab. CCXVI. Fig. 4941.

Root annual. Stems numerous, rather firm, much branched throughout, ascending or decumbent. Leaves ovate, acuminate, 1- to 3-nerved, firm in texture, all sub-sessile, more or less rough and ciliated at the margin. Flowers numerous, in dichotomous cymes terminating the stem and branches, with leaf-like bracts which have not unfrequently 5 or 7 nerves. Pedicels longer than the sepals, ascending or slightly spreading after flowering. Sepals ovate-lanceolate or lanceolate, shortly acuminate, with 3 to 5 hairy nerves, the lateral nerves near the margins, which are narrowly membranous and glabrous. Petals oval-oblanceolate, about two-thirds the length of the sepals. Capsule ovate-ovoid or oblong-ovoid, attenuated towards the apex, as long as the sepals or slightly exceeding them. Seeds roundish-reniform, shagreened. Whole plant more or less pubescent, the hairs sometimes tipped with glands.

Var. α, *sphærocarpa.*

Plate CCXXXV.

A. sphærocarpa, "*Tenore*, Syll. p. 219," *Bab.* *Guss.* Syn. Fl. Sicil. Vol. I. p. 495.

A. serpyllifolia, *Bab.* Fl. Camb. p. 304; and Man. Brit. Bot. ed. v. p. 53. *Boreau*, Fl. du Centre de la Fr. ed. iii. p. 109. *Godr.* Fl. de Lorr. ed. ii. p. 122. *Lloyd*, Fl. de l'Ouest de la Fr. p. 77.

Stems stiff. Sepals ovate-lanceolate. Fruit pedicels ascending. Capsule broadly ovate-ovoid, brittle when ripe.

? Var. β, *leptoclados.*

Plate CCXXXVI.

A. leptoclados, *Guss.* *Bab.* Fl. Camb. p. 304; and Man. Brit. Bot. ed. v. p. 53. *Boreau*, Fl. du Centre de la Fr. ed. iii. p. 109. *Godr.* Fl. de Lorr. ed. ii. p. 123. *Lloyd*, Fl. de l'Ouest de la Fr. p. 77.

A. serpyllifolia, "*Tenore*, Syll. p. 219," *Bab.* *Guss.* Syn. Fl. Sicil. Vol. I. p. 495.

A. serpyllifolia β, leptoclados, *Reich.* l. c.

A. serpyllifolia γ, tenuior, *Koch*, Syn. Fl. Germ. et Helv. ed. ii. p. 128.

Stem rather weak. Sepals lanceolate. Fruit pedicels spreading. Capsule oblong-ovoid, compressible without breaking when ripe.

On walltops and in dry places. Common throughout the whole of Britain; but var. β has as yet been recorded only from England, where it is in many places the more common form, though it is most probable that it will be found to extend to Scotland and Ireland.

England, Scotland, Ireland. Annual. Spring to Autumn.

Root slender. Stem dividing into a number of divisions close to the crown of the root, from 2 to 12 inches long, these branches nearly simple in small examples, but with short branches throughout in the larger ones. Leaves $\frac{1}{8}$ to $\frac{1}{4}$ inch long, all those on the same plant nearly equal in size. Flowers $\frac{1}{8}$ to $\frac{1}{4}$ inch across, white. Peduncles $\frac{1}{8}$ to $\frac{1}{2}$ inch long when full grown, generally straight in var. α, but sometimes curved at the apex after flowering in var. β, though ultimately erect. Outer sepals in var. α usually 5-nerved, the inner ones 3-nerved; in var. β they are generally all 3-nerved, but this is not a constant character. Plant greyish-green, covered with short stiff hairs, which are reflexed on the stem and peduncles, but ascending or spreading on the margins of the leaves and ribs of the sepals.

The extreme forms of varieties α and β are so different that it excites no surprise that they have been considered as distinct species; but so many specimens have come under my notice which cannot be satisfactorily assigned either to the one or the other, that it seems to me better to consider them as varieties than to admit them as sub-species.

One of the forms collected in the Isle of Wight by Mr. A. G. More has been doubtfully referred to A. Lloydii (Jord.). Of the true A. Lloydii I have seen no authentic specimens, and am therefore unable to give a definite opinion; but Lloyd, in "The Flora of the West of France," states that in A. Lloydii the sepals have the hairs not glandular, while in that found by Mr. A. G. More they (as well as those of the rest of the plant) are tipped with glands. This Isle of Wight plant (which I have also found on Deal sandhills and in the Isle of Sheppey) appears to differ from var. α only in shorter and stouter stems, larger capsules more inflated below, sepals more strongly nerved, and hairs of the upper part all tipped with glands. It appears to be A. serpyllifolia, var. β, glutinosa (Koch, Syn. Fl. Germ. et Helv. ed. ii. p. 128). The ordinary forms of both varieties α and β have frequently a few glandular hairs on the sepals.

Thyme-leaved Sandwort.

French, *Sabline à Feuilles de Serpolet.* German, *Quendelblättriges Sandkraut.*

SPECIES III.—ARENARIA NORVEGICA. *Gunn.*

PLATE CCXXXVII.

A. ciliata, var. *Benth.* Handbook Brit. Fl. p. 123.

Rootstock simple or none. Stem producing very short decumbent barren shoots and rather short ascending flowering shoots. Lower leaves oblanceolate, much attenuated towards the base; the upper ones obovate-oblong or oval, all imbricated, sub-sessile, acute, 1-nerved when dry, fleshy, smooth and glabrous except that occasionally there are a few hairs on the margins. Flowers few, in dichotomous cymes (frequently reduced to 1 or 2 flowers) terminating the stem and branches, with ovate or lanceolate leaf-like bracts. Pedicels equalling or slightly exceeding the sepals, erect. Sepals triangular-ovate, acute, with 3 ill-defined glabrous nerves down the middle; the lateral ones often scarcely perceptible; the margins very narrowly membranous and glabrous. Petals oblanceolate, exceeding the sepals by about half their length. Capsule ovate-ovoid, about as long as the sepals. Seeds roundish-reniform, coarsely shagreened. Plant glabrous, except the upper part of the stem and peduncles, which have short hairs, some of them gland-tipped.

On loose gravel. Very rare. On the gravel of a serpentine hill immediately to the North of Baltasound, Unst, Shetland, where it was discovered by the late T. Edmonston. "Found in the Orkneys by Sir R. Murchison and Mr. Peach" (Baker, in Report of Thirsk Nat. Hist. Soc. Bot. Ex. Club for 1858). The late Mr. Robert Heddle informed me that the island in which it occurred was North Ronaldshay.

Scotland. Perennial or Annual? Summer and Autumn.

Root slender, producing a single stem. Stem dividing near the base into numerous equal divisions, which are 1 to 3 inches high. Leaves closely placed, $\frac{1}{8}$ to $\frac{1}{4}$ inch long, increasing in size from the base of the stem to the commencement of the cyme; when fresh appearing nerveless, but showing a rather indistinct midrib when dry. Flowers $\frac{3}{8}$ inch across, white. Seeds roundish reniform.

Norwegian Sandwort.

SPECIES IV.—ARENARIA CILIATA. *Linn.*

PLATE CCXXXVIII.

Reich. Ic. Fl. Germ. et Helv. Vol. V. *Caryoph.* Tab. CCXVII. Fig. 4942.

Rootstock dividing into numerous slender branches, each of which produces a prostrate stem with rather elongate barren and

flowering shoots. Lower leaves strapshaped-oblanceolate, much attenuated at the base; the upper ones generally broader, and sometimes oval; all rather distant, sub-sessile, rather obtuse, strongly 1-nerved when dry, firm (not fleshy), smooth and ciliated at the margins. Flowers few, in irregular dichotomous cymes (often reduced to 1 or 2 flowers), with elliptical leaf-like bracts. Pedicels longer than the sepals, erect. Sepals oblong-lanceolate, rather acute, with 3 strongly-defined hairy nerves down the middle; the margins membranous and ciliated near the base. Petals oblanceolate, about twice as long as the sepals. Capsule ovoid, slightly exceeding the sepals. Seeds roundish reniform, coarsely shagreened. Stem pubescent, with short reflexed hairs throughout.

On rocks. Very rare. On the calcareous cliffs of a high mountain adjoining Ben Bulben, co. Sligo. Such is the original description of the habitat given in "English Botany" (ed. i.); but my specimens are labelled from Ben Bulben itself, so it is probable it also occurs on that mountain, though I have searched for it there in vain.

Ireland. Perennial. Summer and Autumn.

Stems usually very numerous, and somewhat woody at the base, 2 to 6 inches long or more, growing in mats or flakes, with only the flowering shoot at the extremity ascending. Leaves 1 to $\frac{3}{8}$ inch long. Flowers $\frac{3}{8}$ inch across, white.

A. ciliata is certainly very near A. norvegica, but has a very different mode of growth, and developes a much greater extent of rootstock or leafless portion of the stem. The sepals are also of a different shape, having the sides more approaching to parallel, and the apex less acute. The more distinctly-nerved leaves present an obvious character, though not one of much importance, as it depends on the leaves being less fleshy.

Fringed Sandwort.

French, *Sabline Ciliée.*

GENUS X.—HONKENEYA. *Ehrh.*

Flowers imperfectly dioecious. Flowers of the male plants with the petals as long as the spreading sepals, entire or notched. Stamens 10, all fertile, inserted on a thick glandular perigynous disk, which is produced into lobes between the stamens. Ovary abortive, with rudimentary styles. Flowers of the female plant with the petals much shorter than the sepals. Stamens 10,

extremely small, and with abortive anthers. Ovary ovoid, with 3, 4, or 5 short styles. Capsule longer than the sepals, sub-globose, bluntly 6-angled, fleshy, opening by as many valves as there are styles. Seeds few (4 to 8), large, dark chestnut, pear-shaped, compressed, tapering to a point at the extremity where the radicle is situated, convex on the outside, hollowed out on the inner face, shining, and finely granulated with flattened tubercles.

Fleshy perennials, growing on the sea-coast, with the inflorescence in terminal and axillary cymes reduced to solitary flowers.

Honkeneya deserves better to be raised to the rank of a genus than Alsine, from its very peculiar habit; though the large almond-shaped seeds, greatly developed disk, and fleshy capsule are the only technical characters by which it can be separated from the rest of the genus Alsine, while the 6-angled capsule shows an approach to Arenaria.

The name Honkeneya is given in honour of G. A. Honckeney, a German botanist.

SPECIES I.—HONKENEYA PEPLOIDES.* *Ehrh.*

PLATE CCXXXIX. (Named there ALSINE PEPLOIDES.)

Reich. Ic. Fl. Germ. et Helv. Vol. V. *Caryoph.* Tab. CCXIII. Fig. 3670.

Halianthus peploides, *Fries*, Fl. Hall, p. 75; and Mant. III. p. 50. *Koch*, Syn. Fl. Germ. et Helv. ed. ii. p. 121.

Adenarium peploides, *Rufinesque* in *Desv.* Journ. Phys. 1818, p. 250.

Arenaria peploides, *Linn.* *Sm.* Eng. Bot. No. 189. *Benth.* Handbook Brit. Fl. p. 123.

Rootstock creeping. Stems fleshy, slightly dichotomously branched. Leaves fleshy, ovate or oval, acute and recurved at the apex, 1-nerved. Flowers sub-dioecious, few, solitary, terminal and lateral. Pedicels shorter than the sepals. Sepals ovate, obtuse, with 1 distinct and 2 faint nerves and membranous margins. Petals oblanceolate, equalling the sepals in the male and falling short of them in the female flowers. Capsule much exceeding the sepals, sub-globose, fleshy. Seeds very large, obovate, smoothish.

On sandy and shingly seashores. Common and generally distributed.

England, Scotland, Ireland. Perennial. Summer and Autumn.

Rootstock whitish, long and slender, extensively creeping in the sand or shingle, branched, the branches terminating in leafy

* Ehrhart's name is so generally adopted for this genus, that it seems better to retain it, and adopt Meisner's name of Clatertouia for the Tiliaceous genus named Honkeneya by Willdenow.

stems, which are decumbent at the base and erect at the extremities, 2 to 8 inches high, forked and giving off axillary branches; upper part of the stem and branches densely leafy, less so towards the base. Leaves decussate, sessile, $\frac{1}{4}$ to $\frac{3}{4}$ inch long, very fleshy, somewhat keeled below, bordered with a pellucid waved line. Peduncles compressed, very short. Flowers solitary in the forks of the stem and in the axils of the upper leaves, greenish white, $\frac{1}{4}$ inch across; those of the male plants much more conspicuous than those of the female from the petals being larger. Sepals fleshy, with membranous margins and only the median nerve distinct. Stamens 10, 5 longer than the other 5, the filaments alternating with the yellow oblong knobs or glands developed from the fleshy disk which surrounds the conical ovary, which is almost always abortive in the flowers with perfect stamens. Styles 3 to 5. Capsule about the size of a small pea, between leathery and fleshy in its consistence, roundish, obtusely lobed, with only the base embraced by the sepals; valves as many as the styles, entire. Seeds 2 (or sometimes only 1) to each valve, resembling small pear-pips, but of a redder chestnut colour and concavo-convex, with the convex side outwards. Plant deep green, shining and quite glabrous.

It seems highly probable that there is only one species of this genus; for although a second has been described under the name of H. oblongifolia, from the shores of the northern part of the Pacific Ocean and Behring's Straits, yet there appears to be a complete gradation between this and H. peploides, so that at the utmost it ought to be regarded only as a sub-species.

Sea Purslane.

French, *Honckénye Pourpier.* German, *Dickblättrige Salzmiere.*

In Yorkshire this little plant is frequently used as a pickle, and is said to have a pleasant pungent taste.

GENUS XI.—ALSINE. *Wahl.*

Sepals 5 (very rarely 4), somewhat spreading in flower. Petals 5 (very rarely 4), sometimes abortive. Stamens twice as many as the sepals (rarely fewer), all perfect, or sometimes abortive in some of the flowers. Styles usually 3 (rarely 4, 5, or 2); in some species the pistil is abortive in some of the flowers. Capsule about as long as, or longer than the sepals, ovoid-conical, or globose, dry, opening by as many valves as there are styles. Seeds usually numerous, roundish reniform, slightly compressed, generally rough with small points or tubercles.

Small plants with the general habit of Arenaria, with which

genus Alsine no doubt ought to be joined, as is done by Dr. Walker Arnott, Mr. Bentham, and Dr. Hooker; but as long as Silene and Lychnis are kept distinct, the union of the two is inconsistent. The British species of these two genera however differ by the species of Arenaria having broader leaves; all the British Alsines having linear or subulate leaves.

The name comes from αλσος (*alsos*), a grove; because the plants grow abundantly in woods or groves.

Section I.—CHERLERIEÆ. *Fenzl.*

Flowers sub-dicœcious. Petals abortive or absent, especially in the female flowers. Glands of the disk very conspicuous. Leaves short, linear-triquetrous, channelled above. Seeds few, roundish obovate, pointed, so finely granulated as to appear smooth.

Species I.—ALSINE CHERLERIA. *Fenzl.*

Plate CCXL.

Cherleria sedoides, *Linn.* *Reich.* Ic. Fl. Germ. et Helv. Vol. V. *Caryoph.* Tab. CCIV. Fig. 4903.

C. sedoides, *Linn.* et *Auct. Plur.*

Rootstock much branched. Flowering stems very short, erect, and densely leafy. Barren shoots longer and procumbent, with the leaves distant, except at the apex, where they are crowded. Leaves linear-triquetrous, furrowed above, obtuse at the apex, ciliated at the margins, somewhat fleshy. Flowers solitary, terminal, sub-dicœcious. Peduncles about equal to the sepals, or sometimes a little shorter. Sepals oblong-oval, obtuse, 3-nerved, with very narrow membranous margins. Petals none, or sometimes present in the male flowers, and then resembling barren filaments. Glands of the disk oblong. Capsule ovoid-conical, about one half longer than the sepals. Seeds few, nearly smooth.

On rocks and rocky débris; most partial to those of mica slate. Local, and confined to the Scotch Highlands, but abundant on the Breadalbane and Clova mountains, extending North to Sutherlandshire, and reported from Shetland.

Scotland. Perennial. Summer and Autumn.

Rootstock slender, almost woody, thickly clothed with root-fibres; imbedded in the débris in which the plant grows, its branches passing insensibly into stems which, towards the circumference of the tufts, give off trailing barren shoots 1 or 2 inches

long; and short flowering branches very densely clothed with leaves, of which those of the base of the shoots are withered, and only about $\frac{1}{4}$ to $\frac{3}{4}$ inch at the upper part of the stem has the leaves fresh and green. Flowers $\frac{3}{16}$ inch across. Peduncles very short. Sepals with rather thick but not very prominent veins. Ovary conical, very commonly abortive on the plants with perfect stamens. Seeds dark brown, smoother and less reniform than in most of the species of the genus. Whole plant dull yellowish green, glabrous with the exception of the edges of the leaves, forming very compact flat cushions often a foot in diameter. The habit is very much like that of Silene acaulis, the barren shoots are somewhat similar to those of Sagina procumbens, and but for the opposite leaves would be not unlike those of Saxifraga hypnoides.

Mossy Cyphel.

French, *Cherlérie Gazonnante.*

The specific name of this plant—which is retained as such, and was formerly applied to the genus—is in honour of John Henry Cherler, who was assistant to the celebrated botanist John Bauhin, and who worked with him in his General History of Plants.

Section II.—TRIPHANEÆ. *Fenzl.*

Flowers all perfect. Fructiferous calyx not indurated at the base. Petals oval or ovate, abruptly narrowed into a short claw. Seeds tuberculated. Leaves short, linear or subulate, 3-nerved; those of the barren shoots and base of the stem crowded.

Species II.—ALSINE VERNA. *Bartling.*

Plate CCXLI.

Sabulina verna, cæspitosa, et Gerardi, *Reich.* Ic. Fl. Germ. et Helv. Vol. V. *Caryoph.* Tab. CCVII. Figs. 4927, 4929; and Tab. CCVIII. Fig. 4928.

Arenaria verna, *Hook. & Arn.* Brit. Fl. ed. viii. p. 66. *Sm.* Eng. Bot. No. 512.

Rootstock short, slender, almost woody, dividing into numerous branches, each of which produces several erect stems and short ascending barren shoots. Leaves crowded on the barren shoots and at the base of the stem; those towards the middle and upper part of the flowering stem remote; all short, linear-subulate, rather acute, strongly 3-nerved. Bracts ovate-lanceolate, acute, with membranous margins. Flowers in a terminal cyme, few, sometimes reduced to one. Pedicels two to four times the length of the calyx when mature. Sepals elliptical-lanceolate, acute, strongly 3-nerved, with broad membranous margins. Petals about as long as the sepals, or a little longer, oval, suddenly contracted into a very

short claw. Capsule slightly exceeding the sepals. Seeds reniform, rugose with raised dots.

Var. α, *genuina.*

Leaves rather acute, apiculate; those of the base of the stem and barren shoots and root not adpressed.

Var. β, *Gerardi.*

Leaves bluntish, not apiculate; those of the base of the stem and barren shoots adpressed.

On rocks and dry grassy banks. Very local. In Cornwall, Somerset, Wales, Derbyshire, and most of the counties in the North of England. In Scotland, it is abundant on Arthur's Seat, near Edinburgh, and North of which it becomes extremely rare, though it has been found in the counties of Perth and Aberdeen. The Cornwall and Galway plants belong to var. β.

England, Scotland, Ireland. Perennial. Spring and Summer.

Rootstock woody, producing large tufts of barren shoots and leafy bases of the flowering stems, the upper part of the latter rising from 1 to 5 inches above the cushion of leaves. Leaves about $\frac{1}{4}$ inch long, slender, and often curved. Flowers $\frac{3}{8}$ inch across, pure white, very handsome. Pedicels slender. Plant bright green, with the stem and pedicels more or less clothed with gland-tipped hairs, or more rarely (as in the plant from Arran, Galway), quite glabrous.

Professor Babington refers the plant from Cornwall to A. Gerardi (Reich.), describing the leaves as rather blunt, and not at all apiculate. In the only Cornwall specimen which I have seen they are precisely the same as those of the Arran specimens before mentioned; so that these must also be referred to A. Gerardi, though whether it be the true A. Gerardi of the Continent, seems not quite certain, as the various descriptions of it given in different Floras do not appear to apply to the same form.

Vernal Sandwort.

French, *Alsine Printanière.* German, *Frühlings-Alsine.*

It has been remarked by a naturalist—with how much truth we do not know—that this plant has the peculiar power of resisting the deleterious effects of metallic oxides which pervade the refuse heaps of mines; and in such situations, where vegetable life is seldom seen, this little plant flourishes.

SPECIES III.—ALSINE RUBELLA. *Wahl.*

PLATE CCXLII.

Arenaria rubella, *Hook.* in Parry's Second Voyage, Ap. p. 391 ; and Fl. Bar. Arn. Vol. I. p. 100. *Hook. & Arn.* Brit. Fl. ed. viii. p. 66. *Don*, Eng. Bot. Sup No. 2638.

A. quadrivalvis, *R. Brown*, in Parry's First Voyage, Ap. p. 271.

A. verna, var. *Benth.* Handbook Brit. Fl. p. 122.

A verna, var. D. glacialis, *Led.* Fl. Ross. Vol. I. p. 350.

Rootstock branched only at the end, the divisions producing ascending flowering stems and numerous rather short decumbent barren shoots. Leaves rather crowded at the apex of the barren shoots and at the base of the stem; those towards the upper and middle part of the stem remote; all short, strapshaped-linear, rather obtuse, strongly 3-nerved. Bracts elliptical, almost entirely membranous. Flowers in a terminal cyme, generally reduced to 1, and never exceeding 3 flowers. Pedicels a little longer than the calyx when mature. Sepals lanceolate-oblong, acute, strongly 3-nerved, with broad membranous margins. Petals a little shorter than the sepals, lanceolate-oblong, abruptly contracted into the short claw. Capsule slightly exceeding the sepals. Seeds roundish-reniform, slightly rugose with indistinct raised dots.

Among the débris of Alpine rocks. Very rare. Apparently confined to a few of the Breadalbane mountains in Perthshire, and Ben Hope in Sutherlandshire.

Scotland. Perennial. Autumn.

Rootstock woody, imbedded in the micaceous débris in which the plant grows, and dividing repeatedly in a dichotomous manner at the apex, forming tufts 1 to 3 inches across, appearing much less compact and more spread out on the ground than those of A. verna, from the leaves being less crowded, and the barren shoots longer in proportion to the size of the plant. The leaves are also more flaccid, broader, and with the sides less tapering to the apex than in that plant, and the flowering stems project but little beyond the rest of the tuft, being rarely more than 1 inch long. The bracts are less tapering towards the apex. The flowers are mostly solitary, even 2 being of rare occurrence ; and they are much less conspicuous from the petals being not only shorter, but very much narrower than those of A. verna. The styles and valves of the capsule vary from 3 to 5 in number, but are most commonly 4. The seeds are considerably smaller and more orbicular than in A. verna, the colour paler and yellower, and the raised points on the surface much less prominent. Whole plant pale yellowish green, approach-

ing to olive, with the calyx generally red on one side. Whole plant nearly glabrous, except the upper part of the stem and the peduncles, which are clothed with gland-tipped hairs.

The habit of this species is totally distinct from that of A. verna; in its mode of growth it is more like a Sagina, and there appears to be no complete chain of intermediate forms between it and A. verna, although the characters which separate the two may appear on paper to be unimportant.

Alpine Sandwort.

Section III.—SUBULINEÆ. *Fenzl.*

Fructiferous calyx indurated at the base, concolorous. Petals oblanceolate-oblong, gradually narrowed towards the base. Leaves linear-subulate, flat, 3- to 5-nerved. Root annual.

SPECIES IV.—ALSINE TENUIFOLIA. *Crantz.*

Plate CCXLIII.

Sabulina tenuifolia, *Reich.* Ic. Fl. Germ. et Helv. Vol. V. *Caryoph.* Tab. CCIV. Fig. 4916.

Arenaria tenuifolia, *Linn. Benth.* Handbook Brit. Fl. p. 122. *Hook. & Arn.* Brit. Fl. ed. viii. p. 67. *Sm.* Eng. Bot. No. 219.

Root annual, without barren shoots. Stems erect or ascending, paniculately branched (especially at the base); the branches ascending or spreading. Leaves distant (except at the very base of the stem), linear-subulate, mucronate, 3- to 5-nerved, the nerves conspicuous only towards the base. Flowers numerous, in lax dichotomous cymes terminating the stem and branches. Pedicels two to four times the length of the sepals, and considerably longer than the bracts when mature. Sepals lanceolate-acuminate, terminating in subulate points, strongly 3-nerved. Petals oblanceolate-oblong, from one-half to two-thirds the length of the sepals. Capsule about equal in length to the sepals, or a little exceeding them. Seeds roundish-reniform, slightly rugose on the disk, surrounded by a marginal band of small tubercles.

Var. *α, genuina.*

Alsine tenuifolia, *Boreau,* Fl. du Centre de la Fr. ed. iii. Vol. II. p. 107.

Plant entirely glabrous. Stamens 10. Capsule about equal to the sepals, cylindrical-conical.

Var. β, *laxa*.

A. laxa, *Jord.* Pug. p. 34. *Boreau*, Fl. du Centre de la Fr. ed. iii. Vol. II. p. 107.

Plant glabrous, with the calyx and sometimes the leaves clothed with a few glandular hairs. Stamens usually only 5. Capsule longer than the sepals, fusiform-conical.

Var. γ, *hybrida*.

A. hybrida, "*Vill.*" *Jord.* Pug. p. 33. *Boreau*, Fl. du Centre de la Fr. ed. iii. Vol. II. p. 107.

A. tenuifolia β, viscosa, *Bab.* Man. Brit. Bot. ed. v. p. 52.

Upper part of the stem, peduncles, and sepals with glandular hairs. Stamens 8 to 10. Capsule a little longer than the sepals, ovate-conical.

On old walls and in dry fields and waste places. Var. α not very common, and principally found in the South-East of England, extending as far North as Yorkshire. It has been reported from the coast of the Firth of Forth; but it is probable that some mistake has occurred respecting it, or it may have been casually introduced with ballast, as it has not been found recently North of the Tweed. Var. β I have only seen from Great Wilbraham, Cambridgeshire, from which locality I am favoured by Mr. J. G. Baker with specimens collected by Mr. F. Y. Brocas. Var. γ I possess, through the kindness of Mr. Newbould, from Thetford, Suffolk.

England, [Scotland ?]. Annual. Summer.

Stems very slender, 2 to 8 inches high in the larger examples, giving off branches at the base nearly as long as the main stem, and both again giving off short alternate branches terminated by lax dichotomous cymes, so that the arrangement of the whole is paniculate-corymbose. Leaves crowded at the collar of the stem, remote on its upper part, ¼ to ½ inch long, narrowly linear from an enlarged base, generally slightly recurved. Flowers rather numerous, white, $\frac{3}{16}$ inch or a little more across. Pedicels very slender. Seeds pale reddish brown. Plant pale green, with the stems and pedicels frequently tinged with red or purple.

Var. β seems to be scarcely separable even as a variety, although the plant itself and all its parts are more slender; the few gland-tipped hairs on the sepals form a very inconspicuous distinction. Var. γ, however, appears much more distinct; it has the branches more spreading, the capsule considerably broader at the base, so that the closed fruiting calyx is much less slender, and the gland-

tipped hairs on the calyx and pedicels, though variable in quantity, are always sufficiently evident to attract notice.

A. viscosa, Schreb. (Subulina viscosa, Reich. l. c. Tab. CCIV. Fig. 4917), is certainly distinct (at least as a sub-species), having the capsule only about half the length of the sepals. It is also a shorter plant, stouter in proportion to its size, and more distinctly corymbosely branched. This plant does not appear to occur in Britain; that from Thetford, which has been referred to it, is the var. hybrida of A. tenuifolia.

Fine-leaved Sandwort.

French, *Alsine à Feuilles Menues.* German, *Schmallblättrige Alsine.*

Section IV.—MINUARTIEÆ. *Fenzl.*

Fructiferous calyx indurated at the base. Sepals with stripes of a different colour from the ground. Petals oblanceolate. Leaves linear-subulate, 3- to 7-nerved. Root annual or perennial.

SPECIES V.—ALSINE FASTIGIATA. *Bab.*

PLATE CCXLIII. (*bis*).

Minuartia fastigiata, *Reich.* Ic. Fl. Germ. et Helv. Vol. V. *Caryoph.* Tab. CCVI. Fig. 4919.

Arenaria fastigiata, *Sm.* Eng. Bot. No. 1744. *Hook. & Arn.* Brit. Fl. ed. viii. p. 67.

A. fasciculata, *Jacq.* (non *Linn.*). *Sm.*

Alsine Jacquini, *Koch,* Syn. Fl. Germ. et Helv. ed. ii. p. 125. *Gr. & Godr.* Fl. de Fr. Vol. I. p. 250.

Stem erect, paniculately branched; the branches erect. Leaves rather crowded throughout. Flowers numerous, in small fasciculate cymes terminating the stem and branches. Pedicels shorter than, or barely equalling the sepals and bracts. Sepals unequal in length, lanceolate-subulate, white, with 2 green stripes separated by the white central nerve. Petals not half the length of the sepals. Capsule shorter than the sepals. Seeds lenticular-reniform, with regular concentric rows of long acute tubercles which might almost be called spines.

On mountains. Very rare. Said to have been found by Mr. George Don on rocks in the mountains of Clova, Forfarshire, and also in Fifeshire. Dr. Walker Arnott states in the "British Flora," that he possesses specimens from Mr. Drummond, as well as from Mr. G. Don; so that, though it has been found by no botanist at present living, it would scarcely be proper to omit it from the list of British plants. I have one of Don's specimens;

this has no particles of mica adhering to the roots, as most frequently happens with plants gathered on the Clova mountains, where it purports to have been gathered.

Scotland? Annual. Summer and Autumn.

Stem 3 inches to more than 1 foot high, with numerous short ascending branches. Leaves $\frac{1}{2}$ to $\frac{3}{4}$ inch long, enlarged at the base, adpressed. Cymes at first slender, with the pedicels all unequal until the capsules are mature, when they become flat-topped, and then the inflorescence assumes the form of a narrow interrupted panicle of small fascicles, and in this state could be mistaken for no other British species.

Level-topped Sandwort.

French, *Alsine de Jaquin.* German, *Jacquin's Alsine.*

Section V.—ALSINANTHEÆ. *Fenzl.*

Fructiferous calyx not indurated at the base, concolorous. Petals oblanceolate. Seeds reticulated. Leaves fleshy, short, linear or filiform, triquetrous, 1-nerved; those of the barren shoots and base of the stem crowded.

SPECIES VI.—ALSINE ULIGINOSA.

PLATE CCXLIV.

Alsinanthe stricta, *Reich.* Ic. Fl. Germ. et Helv. Vol. V. *Caryoph.* Tab. CCIX. Fig. 4935.

Arenaria uliginosa, *Schlecht.*' *D. C.* Prod. Vol. I. p. 407. *Benth.* Handbook Brit. Fl. p. 122. *Hook. & Arn.* Brit. Fl. ed. viii. p. 66.

Alsine stricta, *Wahl. Bab.* Man. Brit. Bot. ed. v. p. 51.

Spergula stricta, *Swartz.*

Rootstock short, rather slender, somewhat woody, dividing into numerous branches, which give off erect flowering stems, and short ascending barren shoots. Leaves rather crowded on the barren shoots, especially on their apices, and in fascicles produced from the axils of the leaves at the base of the stem, but very remote on the flowering stem, and sometimes absent above the middle; the basal ones rather short, filiform-triquetrous, those of the stem much shorter. Inflorescence a lax dichotomous cyme of few flowers, often reduced to 1 or 2. Pedicels very long, that of the central flower of the cyme (or the only one when it is reduced to one), ten or twelve times as long as the calyx. Sepals oval-lanceolate, acute, 3-nerved. Petals about as long as the sepals. Capsule a little shorter than the sepals. Seeds reniform, with the

sides having on the disk anastomosing ridges, forming narrow openings, and round the margins a slightly rugose band composed of flattened tabular tubercles.

In boggy places. Very rare. By the banks of the stream on the sugar-limestone near the top of Widdy Bank Fell, Teesdale, Durham, from whence I am favoured with specimens by Mr. J. G. Baker.

England. Perennial. Summer.

Plant growing in small tufts, with the leaves $\frac{1}{4}$ to $\frac{1}{2}$ inch long, frequently falcate. The flowering stem 2 to 4 inches high, nearly leafless. Peduncles often 1 inch or more long. Flowers $\frac{3}{4}$ inch across. Seeds very unlike those of any of the previous species; the ridged portion of the disk fuscous; the marginal band reddish brown.

This plant has quite the habit of a Sagina, in which genus it was originally placed by Swartz, though there is a technical distinction in the 3-valved capsule which has caused its removal to Arenaria or Alsine; but, in consequence of this change of place, it becomes necessary to use the name "uliginosa," as there is a well-known American plant, Arenaria (Alsine) stricta, of Michaux, with which it might otherwise be confounded.

Bog Sandwort.

GENUS XII.—SAGINA. *Linn.*

Sepals 4 or 5, concave, spreading when in flower. Petals as many as the sepals, entire or slightly notched, sometimes very small or entirely absent. Stamens 4 when the sepals are 4; 5 to 10 when the sepals are 5. Styles as many as the sepals. Capsule splitting to the base into as many valves as there are sepals.

Small annual or perennial plants, with short filiform or subulate leaves, frequently with fascicles of leaves in the axils. Flowers small, white, generally with long pedicels, in terminal cymes often reduced to single flowers.

In Latin the generic name of this plant signifies fatness, fattening food; and it was supposed by Linnæus that the species possessed this quality, and fattened sheep feeding on them.

Section I.—EU-SAGINA.

Sepals 4. Petals 4, very small or wanting. Stamens 4. Styles 4. Capsule 4-valved.

SPECIES I.—SAGINA MARITIMA. *Don.*

PLATE CCXLV.

Reich. Ic. Fl. Germ. et Helv. Vol. V. *Caryoph.* Tab. CCI. Fig. 4960.
S. stricta, *Fries*, Nov. Fl. Suec. p. 58.

Stems numerous, slender, erect, or ascending; the primary or central one bearing flowers as well as the lateral ones, which are commonly decumbent (but not rooting) at the base. Lower leaves crowded so as to appear like a rosette, soon withering; stem leaves distant; all fleshy, linear-strapshaped, flat above, semi-cylindrical beneath, obtuse or apiculate. Cyme rather few-flowered, lax. Pedicels always erect, long and slender, glabrous. Sepals broadly ovate, concave, hooded and obtuse at the apex, slightly spreading when the capsule is mature. Petals none, or very small. Capsule erect, equal to or a little longer than the sepals. Seeds irregularly semicircular-obovate, slightly rugose. Whole plant quite glabrous.

Var. α, *genuina.*

S. maritima, *Jord.* Obs. sur pl. Plantes Nouv. et Crit. Frag. III. p. 48.

Stems slender, with lengthened internodes, ascending, branched. Capsule equal to, or a little exceeding, the calyx.

Var. β, *debilis.*

S. debilis, *Jord.* l. c. p. 50.

Stems very slender, with lengthened internodes, decumbent and much branched. Capsule generally a little shorter than the calyx.

Var. γ, *densa.*

S. densa, *Jord.* l. c. p. 49.

Stems slender, with short internodes, ascending, very much branched. Capsule a little shorter than the sepals.

Var. δ, *alpina.*

Stems rather stout, with short internodes, ascending, slightly branched. Capsule shorter than the sepals.

On the shores of the sea and tidal rivers, and in places liable to be occasionally overflowed. Vars. α and β rather common. Var.

γ at Christchurch, Hants, and Wisbeach, Cambridgeshire. Var. δ on high mountains. "On the summit of Ben Nevis" (G. Don).

England, Scotland, Ireland. Annual. Summer and Autumn.

Stems from 1 to 6 inches long, generally tinged with brownish purple. Leaves at the base of the stem $\frac{1}{4}$ to $\frac{1}{2}$ inch long, the upper ones shorter, narrower, and less flattened; all obtuse, usually terminated by a very short apiculus or point. Cymes rather few-flowered. Flowers $\frac{1}{5}$ inch across. Sepals often tinged with purple, indistinctly nerved, with narrow membranous margins, more or less spreading when the fruit is ripe. The petals have been absent in all the specimens which I have examined. The stamens are said to be sometimes as many as 8. Styles reflexed in flowering. Capsule ovate-ovoid, erect in every stage of its growth. Seeds very minute, yellowish brown, somewhat semicircular, with small very indistinct irregular tubercles. Plant deep green, often tinged with purple. Var. β seems to be merely a more slender state. Var. γ Professor Babington thinks may be a distinct species, but I have seen plants which I cannot consider distinct from S. maritima to which Mons. Jordan's descriptions would apply. The only alpine specimens I have seen are in the British Museum, and have somewhat the habit of S. nivalis (Fries), which, however, has the flowers pentamerous, the petals conspicuous, the capsules much larger, and the central stem reduced to a leafy rosette.

Sea Pearlwort.

French, *Sagine Maritime.* German, *Meerstrands Sagine.*

SPECIES II.—SAGINA APETALA. *Linn.*

PLATE CCXLVI.

Reich. Ic. Fl. Germ. et Helv. Vol. V. *Caryoph.* Tab. CC. Fig. 4958.

Stems numerous, very slender, ascending or decumbent, the primary or central one bearing flowers as well as the lateral ones, which are commonly decumbent (but not rooting) at the base. Lower leaves crowded so as to appear like a rosette, soon withering; stem leaves distant; all slightly fleshy, setaceous-subulate, flattish above, and slightly convex beneath, tapering at the apex into a short awn or mucro. Cyme rather few-flowered, lax. Pedicels always erect (or very slightly curved after flowering), long and slender, clothed with gland-tipped hairs especially towards the apex. Sepals ovate, concave, hooded, and obtuse at the apex, spreading when the capsule is mature. Petals very minute, or very often absent. Capsule erect, a little longer than the sepals. Seeds semicircular-obovate,

slightly rugose. Plant sparingly glandular-pubescent, with the edges of the leaves ciliated, especially towards the base.

On wall tops, garden walks, and other dry places. Common in England, but rare in Scotland, where I have only seen it at Berwick and Musselburgh, though it has been reported as far North as Perth and Forfarshire; Dr. Walker Arnott, however, refers the Perth plant (which I have not seen) to S. ciliata.

England, Scotland, Ireland. Annual. Spring to Autumn.

Stems diffusely branched, 1 to 7 inches high, the central one, according to Professor Babington, sometimes forming a rosette in the first instance, but flowering late in the season; this form has not come under my notice. The habit is extremely like that of S. maritima, but the stems are more slender, the leaves much less fleshy and they taper gradually to a bristle-like point, the flowers are smaller with the petals more frequently present. The whole plant is deep green, seldom tinged with purple, as in S. maritima. Like the preceding and following species, this plant varies much; but as the varieties have not received specific names, I have not particularized them.

Common Small-flowered Pearlwort.

French, *Sagine Apétale.* German, *Blumenblattlose Sagine.*

SPECIES III.—SAGINA CILIATA. *Fries.*

PLATE CCXLVII.

S. ciliata (*Fries*) *et* depressa, *Schultz.* *Reich.* Ic. Fl. Germ. et Helv. Vol. V. *Caryoph.* Tab. CC. Figs. 4956, 4957.
S. patula, *Jord.* Obs. sur pl. Pl. Nov. et Crit. Frag. I. p. 25.
S. filicaulis, *Jord.* Obs. sur pl. Pl. Nov. et Crit. Frag. VII. p. 16.
S. ambigua, *Lloyd,* Fl. de l'Ouest de la Fr. p. 74.

Stems numerous, very slender, ascending or decumbent, the primary or central one bearing flowers as well as the lateral ones, which are commonly decumbent, but not rooting at the base. Lower leaves crowded so as to appear like a rosette, soon withering; stem leaves generally distant, all slightly fleshy, setaceous-subulate, flattish above, slightly convex beneath, tapering at the apex into a short awn or mucro. Cymes rather few flowered, lax. Pedicels always erect (or very slightly curved after flowering), long and slender, generally glabrous. Sepals ovate, concave; the outer pair contracted at the apex into a slightly curved mucro, the inner pair obtuse; the whole four applied to the capsule when it is mature. Petals very minute, or very often absent. Capsule erect,

as long as (or a little longer than) the sepals. Seeds semicircular-obovate, rugose, with depressed tubercles.

On wall tops, garden walks, and other dry places. Apparently rather rare, but probably often passed over as S. apetala; and it is not unlikely that the distribution of both is similar. The most northern locality in which I have gathered it is on the shore of the Firth of Forth, at Morrison's Haven, between Musselburgh and Preston Pans.

England, Ireland, Scotland. Annual. Spring and Summer.

This plant resembles S. apetala so closely that, but for the small amount of difference which separates all the species of this genus, I should have felt strongly inclined to regard the two as sub-species. The chief difference lies in the mucronate points of the outer sepals in S. ciliata. The leaves are also rather more acute, and the whole plant is of a paler and yellower green.

I confess that, even with aid of authentic specimens, I am unable to distinguish the various plants the names of which are given as synonymous above. S. patula seems to include the most luxuriant forms, with long slender decumbent stems; S. ambigua, a stouter, more erect stemmed and less branched plant; S. filicaulis, a plant with very numerous slender decumbent stems with short internodes: but like the varieties of S. maritima, they appear to be little more than states produced by differences of soil and situation.

The peduncles of all the British specimens I have examined are glabrous, but this does not appear to be so on the Continent. The whole plant varies much in hairiness, but has usually less of this than S. apetala.

Fries' Small-flowered Pearlwort.

SPECIES IV.—SAGINA PROCUMBENS. *Linn.*

PLATE CCXLVIII.

Reich. Ic. Fl. Germ. et Helv. Vol. V. *Caryoph.* Tab. CCI. Fig. 4959.

Rootstock slightly branched. Stems numerous, rather slender, the primary or central one reduced to a barren rosette of leaves, and never bearing any flowers; the lateral one prostrate, and generally rooting at the base, ascending at the apex. Lower leaves crowded; stem leaves rather distant; all slightly fleshy, strapshaped-linear, nearly flat, rather obtuse at the apex, which is suddenly contracted into a short mucro. Cyme very few-flowered, often reduced to a solitary flower. Pedicels recurved at the tip after flowering, ultimately erect, very long and slender, glabrous.

Sepals 4, ovate, concave, hooded and obtuse at the apex, spreading when the capsule is mature. Petals very small (about one-fourth the length of the sepals), or none. Capsule at first nodding, at length erect, 4-valved, a little longer than the sepals. Seeds semicircular-obovate, very slightly rugose. Plant glabrous, or with the edges of the leaves ciliated.

In waste places and cultivated ground; especially partial to wall tops and garden walks. Extremely common, and generally distributed.

England, Scotland, Ireland. Perennial. Spring to Autumn.

This species is easily distinguished from the preceding by the barren central rosette, the prostrate rooting lateral stems, the peduncles hooked at the end after flowering, and, from all but S. maritima, by the broader leaves which do not taper gradually into the apical mucro; this mucro is, however, very much longer than in S. maritima, with which S. procumbens has been confounded, as it appears to be a fleshy variety of the latter which has been described as S. maritima in Grenier and Godron's "Flore de France."

Professor Babington is inclined to refer to S. procumbens the S. ambigua of Lloyd; but Mr. J. G. Baker has furnished me with specimens of that plant named by Professor Boreau, which certainly belong to S. ciliata, with which Lloyd's description also agrees.

Occasionally the flowers are pentamerous, with 5 sepals and a 5-valved capsule, in which case it is often difficult to distinguish it from S. saxatilis; but that species has the petals very conspicuous (half as long as the sepals), and rounded at the apex, the styles erect after flowering, the sepals adpressed to the mature capsule, which is longer and has the valves more tapering.

Mr. Bentham unites S. maritima, apetala, ciliata, and procumbens, giving the name of S. procumbens to the resulting aggregate species.

Procumbent Pearlwort.

French, *Sagine Couchée.* German, *Niederliegende Sagine.*

Section II.—SPERGELLA.

Sepals 5. Petals 5, at least half as long as the calyx and often much more. Stamens 10 or 5. Styles 5. Capsule 5-valved.

SPECIES V.—SAGINA SAXATILIS. *Wimm.*

PLATE CCXLIX.

Spergella saginoides, *Reich.* Ic. Fl. Germ. et Helv. Vol. V. *Caryoph.* Tab. CCII. Fig. 4962.
Spergula saginoides, *Linn. Sm.* Eng. Bot. No. 2105.
Sagina Linnæi, *Presl. Gr. & Godr.* Fl. de Fr. Vol. I. p. 244.

Rootstock branched. Stems numerous, rather slender, the primary or central one reduced to a barren rosette of leaves, and never bearing any flowers; the lateral ones prostrate, and generally rooting at the base, ascending at the apex. Lower leaves crowded, stem leaves rather distant, all slightly fleshy, strap-shaped-linear, nearly flat, rather obtuse at the apex, which is suddenly contracted into a short mucro. Cyme usually reduced to a solitary flower. Peduncles recurved at the tip after flowering, ultimately erect, very long and slender, glabrous. Sepals 5, ovate, concave, obtuse at the apex, glabrous, applied to the capsule when it is mature. Petals nearly half as long as the sepals. Capsule at first nodding, at length erect, 5-valved, generally about twice the length of the sepals. Seeds semicircular-obovate, very slightly rugose. Plant wholly glabrous.

On rocks and wet banks on high mountains. Not uncommon in the Scotch Highlands, where it occurs in the mountains of Perth, Forfar, Aberdeen, Moray, and Sutherland.

Scotland. Perennial. Late Summer and Autumn.

This plant is very like S. procumbens. The chief points of difference have been already mentioned under S. procumbens. When in flower, the large white petals give it a different look, but the larger capsule is really the only important character.

Alpine Pearlwort.

German, *Felsen Sagine.*

SPECIES VI.—SAGINA SUBULATA. *Wimm.*

PLATE CCL.

Spergella subulata, *Reich.* Ic. Fl. Germ. et Helv. Vol. V. *Caryoph.* Tab. CCII. Fig. 4963.
Spergula subulata, *Swartz. Sm.* Eng. Bot. No. 1082.

Rootstock branched. Stems few or not very numerous, rather stout, the primary or central one reduced to a barren rosette of leaves, and never bearing any flowers; the lateral ones short,

decumbent but rarely rooting at the base until after flowering, erect or ascending at the apex. Lower leaves crowded, stem leaves distant, all slightly fleshy, linear-subulate, acute, gradually contracted into a mucro. Cyme usually reduced to a solitary flower. Peduncles slightly recurved at the tip after flowering, ultimately erect, extremely long and slender, more or less pubescent. Sepals 5, oblong-lanceolate, obtuse at the apex, with distant gland-tipped hairs, applied to the capsule when it is mature. Petals about as long as the sepals. Capsule at first nodding, at length erect, 5-valved, a little longer than the sepals. Seeds semicircular-obovate, slightly rugose. Plant more or less covered with scattered gland-tipped hairs.

On damp sandy places, and on heaths. Rather rare. Sparingly but widely distributed over the whole country, though more rare in the South.

England, Scotland, and Ireland. Perennial. Summer.

Closely allied to S. saginoides, but having the leaves insensibly instead of abruptly tapering into the mucro, which is longer than in that species. The rootstock has longer and thicker branches, and the tufts to which these branches give rise are much more compact from the stems assuming an ascending direction nearer to the base; they are from 2 to 5 inches high, including the peduncles, which are considerably longer than those of S. saxatilis. The flowers are larger, but the sepals are narrower in proportion, and cover more of the capsule than in S. saginoides. The glandular hairs on the plant are an obvious distinction, but one on which much dependence cannot be placed.

Mr. Bentham unites S. subulata with S. saginoides, giving to the two Presl's name of S. Linnæi; but if any of the species should be combined, it should surely be S. saxatilis and S. procumbens, which have exactly the same habit and mode of growth, and indeed are often extremely difficult to separate in the dried state, unless the specimens happen to have mature capsules.

The mode of growth in this and the other perennial species of Sagina is, first, the production of a rosette, from the lower leaves of which axillary stems are produced. These lateral stems in S. procumbens and saginoides take root early, but in S. subulata, nivalis, and nodosa, not until a much later period. The lateral stems alone produce flowers, which are in a terminal cyme. Besides this they produce, later in the season, a bud towards the base of the flowering stem, which grows into the central barren rosette of the succeeding year. The rosette of the parent at last withers, and the lateral stems become separate plants, united together until set free by the decay of the connecting portion, which is superficial

in S. procumbens and saginoides, but shorter and generally buried in S. subulata, nivalis, and nodosa.

Awl-shaped Pearlwort.

French, *Spargoute en Alène.* German, *Pfriemblättrige Sagine.*

SPECIES VII.—SAGINA NIVALIS. *Fries.*

PLATE CCL. (*bis*).

Spergula nivalis *Lindblom*, (*Fries*, Mant. III. p. 51).
Spergula saginoides, var. β nivalis, *Lindblom*, olim.
Sagina subulata, var. β nivalis, *Hook & Arn.* Brit. Fl. ed. viii. p. 64.

Rootstock much branched. Stems few or rather numerous, rather stout, the primary or central one reduced to a barren rosette of leaves, and never bearing any flowers; the lateral ones short and decumbent, but rarely rooting at the base; erect or ascending at the apex. Leaves all rather crowded, slightly fleshy, strapshaped-linear, gradually attenuated at the apex, which is without a distinct mucro. Cyme reduced to a single flower. Peduncles short, always erect, glabrous. Sepals 5, broadly ovate, obtuse, glabrous, applied to the capsule when mature. Petals about as long as the sepals. Capsule erect, 5-valved, once and a half the length of the sepals. Seeds semicircular-obovate, rugose. Plant entirely glabrous.

On Alpine rocks. Very rare. I possess imperfect specimens through the Botanical Society of Edinburgh, from Ben Lawers, collected with Alsine rubella by Professor Balfour, to whose kindness I am indebted for being enabled to include this species amongst British plants, on undeniable authority; for, fearing that there had been some transposition of labels, I applied to that gentleman, and he informed me that he had other specimens collected at the same date (August, 1847) glued down with Alsine rubella. He also sent for my inspection a specimen of the Sagina, from which our drawing of the plant in an advanced state has been taken (the early state is from a Norwegian specimen in my own possession). Dr. Walker Arnott has mentioned it as occurring in the Isle of Skye and in the Clova Mountains, but does not give the collector's name. Professor Babington, in the third edition of his "Manual," mentioned a plant collected by Mr. Backhouse in Glass Mhiel, Forfarshire; but as he has omitted it in subsequent editions, it is probable that he has ascertained that it was not Fries' plant.

Scotland. Perennial. Summer.

Plant growing in small dense tufts; stems scarcely an inch high, including the peduncles, which are shorter than in any of the preceding species, not being more than twice or thrice the length of the calyx. The leaves have an extremely indistinct mucro, in this differing both from S. saxatilis and S. subulata, from which also its more compact manner of growth and peduncles not reflexed after flowering form sufficient distinctions; indeed, it has much more the habit of S. maritima than of any other of the British species of Sagina; but, besides being a perennial and having a barren central rosette, it has pentamerous flowers, the leaves more tapering at the apex, the peduncles much shorter, the petals very much larger, and the styles erect after flowering.

Lindblom's Pearlwort.

SPECIES VIII.—SAGINA NODOSA. *E. Meyer.*

PLATE CCLI.

Spergella nodosa, *Reich.* Ic. Fl. Germ. et Helv. Vol. V. *Caryoph.* Tab. CCIII. Fig. 4965.
Spergula nodosa, *Linn. Sm.* Eng. Bot. No. 694.

Rootstock slightly branched. Stems rather few, the primary or central one reduced to a barren tuft of leaves, never producing any flowers, the lateral ones curved, ascending, not rooting at the base. Lower leaves crowded, the upper ones more remote, generally producing fascicles of leaves in their axils; all somewhat fleshy, subulate, abruptly pointed with an indistinct mucro. Cyme few-flowered. Peduncles rather short, erect, glabrous or with gland-tipped pubescence. Sepals 5, oval, concave, very obtuse, glabrous or with gland-tipped pubescence applied to the capsule when mature. Petals much longer than the sepals, sometimes nearly twice as long. Capsules a little longer than the sepals. Seeds roundish-obovate, rugose, with distinct tubercles. Plant glabrous or with the upper part of the stem, bases of the leaves, and calices glandular-hairy.

In damp sandy places. Not uncommon, and generally distributed.

England, Scotland, Ireland. Perennial. Summer and Autumn.

Plant growing in small lax tufts, with the lateral stems spreading in a circle, decumbent at the base, 3 to 8 inches long, having a peculiar knotted appearance (from which the plant takes its specific name) caused by the small bundles of leaves produced from the axils of the upper stem-leaves. Flowers $\frac{1}{4}$ inch across, white, very much larger than any of the other species of the genus. The

seeds are also rounder and more distinctly tuberculated. The plant is of a deep green colour.

Knotted Spurrey, Sand Chickweed.

French, *Spargoute Nodeuse.* German, *Knotige Sagine.*

Sub-Order III.—POLYCARPEÆ.*

Sepals, stamens, and ovary sessile within the calyx. Styles free or combined at the base, 3, 4, or 5. Leaves with scarious stipules at the base.

GENUS XIII.—SPERGULA. *Linn.*

Sepals 5, spreading in flower. Petals 5, entire. Stamens 10 or 5. Styles 5 (rarely 3). Capsule longer than the sepals, splitting into 5 valves opposite the sepals (into 3 in the species which has 3 styles). Seeds coal-black, globular-compressed or orbicular-reniform, surrounded by a keel which is generally more or less produced into a membranous whitish wing round the seed.

Annuals with geniculate ascending stems and opposite filiform-linear leaves, having between them small scarious stipules, of which the two on each side are united into one. Leaves with fascicles of similar leaves in the axils, giving an appearance of their being in whorls. Flowers white, in dichotomous cymes, of which the branches are most frequently reduced to false unilateral racemes somewhat resembling those of Boraginaceæ. Fruit pedicels reflexed.

The name of this genus is from *spargere*, to scatter, because it scatters its seeds abroad with an elastic force, to the great profit, it is said, of the farmer in Holland where the species grow most abundantly.

SPECIES I.—SPERGULA ARVENSIS. *Linn.*

Plates CCLII. CCLIII.

Leaves semi-cylindrical above, having a shallow longitudinal furrow beneath. Styles and valves of the capsule 5. Seeds globular-lenticular, rough, with small tubercles puckered at the base,

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* The presence of stipules is surely a better character for this sub-order than the union of the styles at the base.

surrounded by a sharp keel, which is frequently whitish on the exterior margin. Plant sparingly clothed with gland-tipped hairs, especially on the upper part of the stem, peduncles, and sepals.

Var. *α*, *sativa*.

PLATE CCLII.

Spergula sativa (*Böningh.*), in *Reich.* Pl. Crit. Cent. VI. No. 704.
S. arvensis, *Linn.* *Reich.* Fl. Germ. Excurs. p. 567. *Boreau*, Fl. du Centre de la Fr. ed. iii. Vol. II. p. 102.

Stamens 10. Seeds without papillæ.*

Var. *β*, *vulgaris*.

PLATE CCLIII.

Spergula vulgaris (*Böningh.*), in *Reich.* Pl. Crit. Cent. VI. No. 705.
S. vulgaris, *Böningh.* *Reich.* Fl. Germ. Excurs. p. 567. *Boreau*, Fl. du Centre de la Fr. ed. iii. Vol. II. p. 103.
S. pentandra, *Sm.* Eng. Bot. No. 1536 (non *Linn.*).

Stamens commonly fewer than 10, and very frequently only 5. Seeds with small pale clavate deciduous papillæ.

In cultivated fields, especially on a light soil. Common, and generally distributed.

England, Scotland, Ireland. Annual. Summer and Autumn.

Stems geniculate, ascending, 3 to 15 inches high, generally dividing into several close to the crown of the root, the divisions slightly dichotomously branched. Leaves rather distant, somewhat fleshy, $\frac{1}{2}$ to $1\frac{1}{2}$ inch long, appearing to be in whorls from the two opposite axillary fascicles meeting round the stem. Stipules small, membranous. Cymes terminal, with the ultimate branches forming false racemes from the abortion of the branches on one side, with pairs of small triangular sub-membranous bracts at the base of the forks and pedicels. Sepals ovate, obtuse, very indistinctly nerved, and surrounded by a very narrow membranous border. Petals a little longer than the sepals. Stamens variable in number, from 4 to 10. Fruit pedicels slender, $\frac{1}{2}$ to 1 inch long, spreading or reflexed. Capsule longer than the calyx, subglobular-conical. Seeds closely covered with tubercles, puckered at the base, and surrounded by a narrow keel, which is smooth and generally pale at the margin when the seed is mature.

In var. *β* the seeds have small papillæ looking like gland-tipped

* The seeds of varieties *α* and *β* have been inadvertently transposed in the two plates.

hairs. There seems to be no difference in habit between the two varieties which would justify their being considered even as subspecies. Var. β I have only seen from Lancashire; but no doubt it is generally passed over on account of the microscopical character of the difference between it and var. α.

Corn Spurrey, or Yarr.

French, *Spargoute des Champs.* German, *Feld Sperk*, or *Spark.*

In most fields with light soils this is a common weed. In Germany, Holland, and the Netherlands it is grown for fodder, and the seed is sown on corn stubbles to supply a bite for sheep during winter. It is very much esteemed as food for cattle, and by French writers is asserted to be equal to clover. It is said to enrich the milk of cows, and to cause it to make good butter. Sheep fed on it are supposed to do better than those fed on turnips. Hens eat Spurrey greedily, and it is believed to induce them to lay a greater number of eggs. The seeds contain a large quantity of good oil, obtainable by expression; when bruised, they form excellent food for cattle. In Finland and Scandinavia, bread has been made of the seeds of the Spurrey in time of scarcity. This plant seems to be a favourite with farmers on the Continent: here, on the contrary, it is regarded rather as a troublesome weed; so much so that in Norfolk it is called Pickpurse, and is supposed by our farmers to merit the name.

GENUS XIV.—SPERGULARIA. *Pers.**

Sepals 5, spreading in flower. Petals 5, entire, sometimes absent. Stamens 10, 5, or (by abortion) fewer. Styles 3 (more rarely 5). Capsule with 3 (rarely 5) entire valves; in the latter case alternate with the sepals. Seeds obliquely reniform-roundish or -obovate, flattened, brown or brownish black, sometimes surrounded by a membranous marginal wing.

Annual or perennial plants with the stems generally procumbent, and opposite filiform-linear often fleshy leaves, having between them scarious stipules generally distinct, while in axils of the leaves there are often fascicles of smaller leaves. Flowers pink or lilac, in dichotomous cymes, sometimes reduced to false unilateral racemes, with the pedicels spreading, reflexed after flowering.

This is doubtless a distinct genus from Spergula, resembling Alsine in habit, from which, however, the stipules separate it; but it is difficult to find technical characters. The styles being 3 or 5 is very unsatisfactory; Spergularia fallax (Lowe), which has 3 styles, is certainly a true Spergula.

* The name Lepigonum (Fries) is inadmissible, as Spergularia was clearly characterized by Persoon as a section of Arenaria (Syn. Pl. Vol. I. p. 504) at an earlier date.

SPECIES I.—SPERGULARIA RUBRA. *Fenzl.*

PLATE CCLIV.

Arenaria rubra, *Linn.* *Sm.* Eng. Fl. Vol. II. p. 311.
Lepigonum rubrum, *Fries,* in Fl. Hall. p. 76. *Bab.* Man. Brit. Bot. ed. v. p. 127. *Fries,* Mant. III. p. 33. *Koch,* Syn. Fl. Germ. et Helv. ed. ii. p. 121.

Root annual or biennial. Leaves scarcely fleshy, flat, filiform-linear, tapering to an acute and generally mucronate point. Stipules lanceolate, acuminate, usually cleft, silvery white. Pedicels when mature exceeding the bracts, and one and a half to three times as long as the capsule. Sepals oblong-lanceolate. Petals shorter than the calyx, purplish rose, shading into white at the base. Stamens generally fewer than 10. Capsule about as long as the calyx. Seeds dark brown, rugose with tubercles puckered at the base, most prominent round the margin, plano-convex, semicircular-obovate, with a raised rim round the curved margin, but none of them winged. Stem, pedicels, and sepals pubescent with gland-tipped hairs.

In dry sandy and gravelly places. Common throughout the country, except in the extreme North of Scotland, from which it appears to be absent.

England, Scotland, Ireland. Annual or Biennial. Summer and Autumn.

Root long, tapering, producing from its crown numerous decumbent branched stems, generally spreading in all directions, 3 to 8 inches long. Leaves $\frac{1}{4}$ to $\frac{1}{2}$ inch long. Stipules very conspicuous from their large size and silvery appearance, generally torn at the apex. Flowers $\frac{1}{4}$ inch across, chiefly in terminal pseudo-racemes. Sepals ovate-lanceolate, indistinctly nerved, with a broad white border. Fruit pedicels $\frac{1}{4}$ to $\frac{1}{2}$ inch long, more or less spreading or even reflexed after flowering, ultimately sub-erect. Capsule about $\frac{1}{5}$ inch long, with numerous small dark-brown seeds, convex on both sides, surrounded by a raised ring. Plant dull green.

Field Sandwort-Spurrey, Red-flowering Field Spurrey.

French, *Spergulaire Rouge.* German, *Rothe Schuppenmiere.*

SPECIES II.—SPERGULARIA NEGLECTA.

PLATE CCLV.

Lepigonum neglectum, "*Kindb.*" *Bab.* Man. Brit. Bot. ed. v. p. 127.
Spergularia marina, var. *α*, *Hook. & Arn.* Brit. Fl. ed. viii. p. 153.
Spergularia marina, *Garcke,* Fl. von N. und Mit.-Deutsch. ed. vi. p. 69.
Arenaria marina, *Roth.* *Lloyd,* Fl. de l'Ouest de la Fr. p. 80.
Arenaria rubra, *Sm.* Eng. Bot. No. 852 (*l*).

Root annual or biennial. Leaves fleshy, semi-cylindrical, filiform-linear, tapering to an acute point. Stipules deltoid-ovate, entire, dull whitish. Pedicels longer than or equal to the bracts, as long as or longer than the capsule. Sepals oblong-lanceolate. Petals shorter than the calyx, purplish rose, shading into white at the base. Stamens generally fewer than 10. Capsule slightly exceeding the calyx, rarely one-third longer. Seeds pale brown, nearly smooth, with or without distinct papillæ, plano-concave, obovate-roundish, with a raised rim round the outer margin, most of them without wings, but occasionally there are a few winged ones towards the base of the capsule. Stem, pedicels, and sepals with a few gland-tipped hairs or sub-glabrous.

Var. α, *genuina*.

Lepigonum neglectum, *Kindb.* Symb. ad Syn. Gen. Lep. *Brebisson*, Fl. de la Normandie, p. 54.

Upper pedicels longer than their scarious bracts (destitute of leaf-like bracts, or with very small ones), and generally exceeding the capsule. Seeds with prominent papillæ.

Var. β, *salina*.

Spergularia salina, *Presl.* Fl. Cech. p. 93 (*Fries*).
Lepigonum salinum, *Kindb.* l. c. *Brebisson*, l. c. p. 54. *Fries*, Mant. III. p. 34.

All the pedicels about equal to their leaf-like bracts, and twice as long as the capsule. Seeds without papillæ.

Var. γ, *media*.

Lepigonum medium, "*Fries.*" *Kindb.* l. c.; *Brebisson*, l. c. p. 54; *Fries*, l. c. p. 33.

All the pedicels shorter than their leaf-like bracts, and scarcely as long as the capsule. Seeds without distinct papillæ.

In sandy and muddy places on the sea-coast. Common and generally distributed, reaching as far North as Orkney.

England, Scotland, Ireland. Annual or Biennial. Summer and Autumn.

This plant differs from S. rubra in having the leaves thicker and more fleshy, the stipules united, shorter and duller in colour, the petals paler rose-coloured, and with more of the base white, the capsule generally larger, the seeds more compressed, rounder in shape and of a pale yellowish brown, without tubercles wrinkled at the base. In var. α there are small prominent papillæ upon them, but in varieties β and γ these are absent. Besides these differences, there is also the fact of there being occasionally a few

of the seeds in each capsule surrounded with a membranous wing half the width of the seed, striated and jagged at the edges, the striæ being nerves running out into the points of the teeth. Plant deep green, slightly shining, generally more glabrous than S. rubra.

I have followed Mr. A. G. More in uniting the three forms enumerated as varieties above. A microscopical examination of the seed shows that the roughness of var. α is not produced by tubercles as in S. rubra, but by the presence of soft papillæ something like those on the seeds of Spergula arvensis, var. vulgaris; and there is such a gradual transition in the length of the pedicels, that little reliance can be placed upon that character. The scarious bracts of var. α are stipules, generally not accompanied by green eaves. Kindberg places his S. medium in the section with a perennial root; but Fries, in his "Summa Vegetabilium Scandinaviæ," makes no correction of Koch's statement that it is an annual, so that it must be supposed that he concurred in this opinion. Professor Babington, in the fifth edition of his "Manual," says that his S. neglectum "includes plants resembling the S. medium and S. salinum of Fries," which seems to imply that he is in doubt whether the forms of which he speaks be really the same as Fries' plants so named; and as I have not seen authentic specimens, I can only judge from his descriptions, which appear to apply to our varieties β and γ.

Lesser Sea Sandwort-Spurrey.

French, *Spergulaire Négligé.* German, *Salz-Schuppenmiere.*

SPECIES III.—SPERGULARIA MARGINATA.

PLATE CCLVII.

Lepigonum marginatum, *Koch*, Syn. Fl. Germ. et Helv. ed. ii. p. 121.
L. marinum, "*Wahl.*" *Bab.* Man. Brit. Bot. ed. v. p. 127. *Fries*, Mant. III. p. 55. *Brebisson*, Fl. de la Normandie, p. 54.
Spergularia media, β marginata, *Fenzl. Gr.* & *Godr.* Fl. de Fr. Vol. I. p. 276.
S. media, *Garcke.* Fl. von N. und Mit.-Deutsch. ed. vi. p. 69.
S. marina, var. β, *Hook.* & *Arn.* Brit. Fl. ed. viii. p. 153.
Arenaria marginata, *D. C.* Fl. Fr. Vol. IV. p. 793.
A. marina, *Sm.* Eng. Bot. No. 958.
A. media, *Linn.* Sp. Pl. p. 606.

Root biennial or perennial. Rootstock slender, branched, scarcely woody. Leaves fleshy, semi-cylindrical, filiform-linear, sub-acute. Stipules deltoid-ovate, dull whitish, entire. Pedicels much longer than the bracts, and two to three times the length of the capsule. Sepals ovate. Petals as long as the sepals, pale lilac or nearly white, concolorous. Stamens 10. Capsule longer than the calyx, often twice as long. Seeds pale brown, smooth, without

papillæ, plano-concave, obovate-roundish, with a raised rim round the outer margin, all of them nearly surrounded by a white membranous wing. Whole plant glabrous.

In salt marshes and muddy places by the sea-coast. Common, and generally distributed, reaching as far North as Orkney.

England, Scotland, Ireland. Biennial or Perennial. Summer and Autumn.

A larger and stronger plant than S. neglecta, with a more or less evidently branched rootstock between the root and the stems. The most striking difference, however, is the much larger size of the flowers, calyx, and capsule, and all the seeds being surrounded by a broad white membranous wing. The flowers are $\frac{3}{8}$ inch across, much paler than those of S. neglecta. The sepals are broader and $\frac{1}{4}$ inch long. The capsule always conspicuously protruded. The seeds are precisely similar to the winged seeds of S. neglecta, to the larger and smoother forms of which it very closely approximates.

Greater Sea Sandwort-Spurrey.

French, *Spergulaire Marine.* German, *Mittlere Schuppenmiere.*

SPECIES IV.—SPERGULARIA RUPESTRIS. *Lebél* (non *Camb.*).

PLATE CCLVI.

Lepigonum rupestre, *Kindb.* l. c. *Bab.* Man. Brit. Bot. ed. v. p. 127. *Brebisson*, Fl. de la Normandie, p. 54.

Root perennial. Rootstock slender, branched, somewhat woody. Leaves fleshy, semi-cylindrical, filiform-linear, tapering to an acute and often mucronate point. Stipules triangular-ovate, entire or slightly cleft, white, inclining to silvery. Pedicels much longer than the bracts, two to four times the length of the capsule. Sepals oblong-ovate. Petals as long as the sepals, pale purplish rose-colour, concolorous. Stamens 10. Capsule equalling the calyx. Seeds dark reddish brown, smooth, with prominent papillæ, plano-convex, obovate, without a distinct raised rim, none of them winged. Stem, pedicels, and calyx closely covered with gland-tipped hairs.

On rocks by the sea-coast. Rather rare. Luccombe, Isle of Wight; Lizard, Cornwall; Criccieth, Carnarvonshire, are the only places in England from which I possess specimens; but no doubt it will be found at intermediate stations if searched for. Professor Babington gives it as a native of Ireland.

England, Ireland. Perennial. Summer and Autumn.

In habit much resembling S. marginata, as it has the large calices and flowers of that plant, but the stipules are of a more

brilliant white, and the leaves have more frequently fascicles of smaller leaves in their axils. The thick coating of glandular pubescence forms a very obvious character. The seeds are quite different from those of any other British species, being nearly regularly obovate, the outer margin partaking very little of the semicircular curve which obtains in S. rubra, and the surface is not ornamented with star-based tubercles as in that species, but studded over with small rather distant projecting warts or papillæ. The colour of the seeds is rich dark brown, very different from the pale yellowish colour of those of S. marina. The outermost of the imbricated sepals are considerably narrower than the others (as in the rest of the genus), and the innermost ones have broad scarious margins; it is from the latter that the shape described in the specific character is taken.

This species was first introduced amongst British plants in the "London Catalogue of British Plants," fifth edition, page 2, No. 171*; but the authority given, "Cambessedes," was a typographical error for Lebél. The introduction was made on the authority of specimens collected by myself at Cobo Bay, Guernsey; and as I had received authentic French specimens from M. Lenormand, of Vire, I was able to identify it with certainty. The Spergularia rupestris of Cambessedes is a very different plant, namely, Arenaria Bonariensis (Hooker), which is a native of Australia. On this account Dr. Lebél afterwards changed the name to "rupicola;" but as "rupestris" has come into general use, it seems unnecessary to abandon it.

Rock Sea Sandwort-Spurrey.

French, *Spergulaire des Rochers.*

GENUS XV.—POLYCARPON. *Linn.*

Sepals 5, keeled, hooded at the apex, spreading in flower. Petals 5, small, entire or slightly notched. Stamens 3 to 5. Style short, 3-cleft. Capsule 3-valved. Seeds numerous, semicircular-ovoid, shagreened, not winged.

Small dichotomously-branched herbs, with obovate or oblong opposite or whorled leaves with scarious stipules. Flowers very small and numerous, crowded in terminal dichotomous cymes with scarious bracts.

SPECIES I.—POLYCARPON TETRAPHYLLUM. *Linn. fil.*

PLATE CCLVIII.

Annual. Leaves at the base of the stem generally in fours, those of the branches opposite. Sepals mucronate. Petals notched, shorter than the calyx.

In sandy places. Rare. Confined to the South-West of England, where it occurs in the counties of Cornwall, Devon, and Dorset. It has also been reported from Glamorganshire; but this extension of its northern limit requires confirmation. It is very common in the Channel Islands.

England. Annual. Summer.

Stem dividing into several at the crown of the root, these again sparingly dichotomously branched, 3 to 7 inches long. Leaves $\frac{1}{2}$ inch long (or less), obovate, narrowed at the base into a short petiole, rounded at the apex. Lower pairs of leaves with a second pair at right angles to them so as to appear whorled. Stipules triangular-lanceolate, white. Cymes very much branched, and with very numerous flowers, which are about $\frac{1}{5}$ inch across, on short pedicels. Sepals green or purplish, with broad white scarious margins. Petals scarious, shorter than the sepals. Stamens 3 to 5. Capsule about as long as the calyx, with the valves straight, their edges rolled inwards. Seeds yellowish brown, semicircular, compressed, with elongated raised points disposed in irregular striæ. Plant green, often tinged with purple, slightly succulent, without hairs, but with the stem and pedicels having very small papillæ resembling those of the ice-plant in miniature.

Four-leaved All-Seed.

French, *Polycarpe à Quatre Feuilles.* German, *Vierblättriges Nagelkraut.*

EXCLUDED SPECIES.

SILENE ALPESTRIS. *Jacq.*

Said to have been found by Mr. G. Don on a rock on a mountain to the East of Clova.

BUFFONIA ANNUA. *D. C.*

B. tenuifolia, *Sm.* Eng. Bot. No. 1313.

Said to have occurred about Boston in Lincolnshire, and on Hounslow Heath, in the time of Plunkenet and Dillenius; but there is little doubt that a mistake as to the species had been made in both instances.

SPERGULA PENTANDRA. *Linn.*

Said to have been gathered in Ireland by Sherrard; but the Rev. W. W. Newbould is inclined to think (from the references in the old Herbarium) that the plant under that name was really one of the pentandrous Spergulariæ.

ORDER XIII.—PORTULACACEÆ.

Herbs, rarely undershrubs, often glabrous and more or less succulent. Leaves opposite or alternate, entire. Stipules scarious, sometimes lacerated, or represented by tufts of hair, frequently entirely absent. Flowers perfect and nearly or quite regular, generally terminal (occasionally lateral), solitary, racemose, paniculate, or cymose. Sepals commonly 2 (more rarely 3 to 5), free or united to the base of the ovary, imbricated, persistent or deciduous. Corolla commonly of 5 (more rarely 4, or very numerous) petals, which are commonly hypogynous, generally united at the base (more rarely free), imbricated, entire. Stamens inserted with the petals, and often adhering to their base, equal in number to the petals or more numerous; sometimes fewer, and then opposite to the petals. Ovary free or adhering to the calyx at the base, 1-celled. Style 3-cleft (or more rarely 2-cleft) at the apex, with the inside of the branches stigmatiferous. Placentæ at the base of the ovary or on a central columella. Ovules 3 or numerous (rarely only 2), amphitropous. Capsule membranaceous or crustaceous, opening by as many valves as there are styles, splitting transversely, rarely indehiscent. Seeds 3 or numerous, reniform, globose, obovate or lenticular, generally with a hard testa. Albumen farinaceous. Embryo generally more or less curved, with the radicle near the hilum.

GENUS I.—MONTIA. *Linn.*

Sepals 2 (rarely 3), free, persistent, broadly ovate. Petals 5, unequal, the two exterior ones larger, the whole united into a monopetalous corolla split down one side. Stamens 3 (rarely 4 or 5), inserted into the tube of the corolla. Ovary free. Style short, 3-cleft. Capsule turbinate-globose, trigynous, concealed in the calyx, 1-celled and 3-seeded, with the valves rolling inwards at the edges after flowering. Seeds sub-orbicular, compressed.

A small succulent plant with opposite oblanceolate or obovate leaves and small white flowers in few-flowered terminal and axillary cymes.

This genus was named in honour of Joseph Monti, a physician of Bologna, who flourished in the eighteenth century.

SPECIES I.—MONTIA FONTANA. *Linn.*

PLATE CCLIX.

Stamens generally 3. Seeds shagreened, slightly shining.

Var. α, *minor*.

M. minor, *Gmel. Gr. & Godr.* Fl. de Fr. Vol. I. p. 606. *Boreau,* Fl. du Centre de la Fr. ed. iii. Vol. II. p. 250.

Stems short, not flaccid. Cymes (or pseudo-racemes) terminal and axillary. Seeds with concentric rows of conical tubercles.

Var. β, *rivularis*.

M. rivularis, *Gmel. Gr. & Godr.* Fl. de Fr. Vol. I. p. 606. *Boreau,* Fl. du Centre de la Fr. ed. iii. Vol. II. p. 250.

Stems elongated, flaccid. Cymes all axillary. Seeds closely covered with flattened tubercles.

In moist places. Var. α, in places overflowed in winter, etc.; but not in deep water. Var. β, in ditches and brooks. Common throughout the country.

England, Scotland, Ireland. Annual or Biennial (var. β, Perennial). Spring to Autumn.

Var. α with the stems densely tufted, 1 to 4 inches high, ascending, dichotomous. Leaves about $\frac{1}{4}$ inch long, elliptical, attenuated at the base into a sub-parallel portion, which is dilated at the very bottom, where it is united with the opposite leaf; apex rather acute. Flowers in axillary or terminal 2- to 5-flowered cymes, the terminal ones with a scarious ovate apiculate bract at the base. Pedicels at first curved, at length erect. Sepals roundish-rhomboid. Petals a little longer than the sepals, but the whole flower not more than $\frac{1}{10}$ inch across. Capsule a little broader upwards, reduced at the apex, with 3 brownish-black seeds studded with concentric rows of conical tubercles. Plant rather pale green, quite glabrous and slightly succulent.

Var. β (which perhaps ought rather to be considered as a sub-species) is generally perennial, and floats in water, from which the tips of the stems emerge, and are so closely packed together that they give a deceitful appearance of solidity which is apt to mislead the unwary into the belief that there is firm ground below. The length of the stems varies according to the depth of water, but they are sometimes as much as 18 inches long. The leaves are $\frac{1}{2}$ to $\frac{3}{4}$ inch long, of a much deeper green, and generally more obtuse at the apex than in var. α. The cymes are all axillary, and have sometimes as many as 6 or 7 flowers; but the only difference which

cannot be ascribed to the different circumstances of growth is in the seeds, which are considerably larger than those of var. α, more inclining to claret-colour, with the tubercles close together and not at all prominent, and from reflecting the light more equally they have a shining appearance.

Mons. Godron, in the "Flore de France," points out that the assemblage of flowers called a cyme, in Montia consists of a central flower and an axillary pseudo-raceme. In the lateral cymes the apparent continuation of the leafy stem is really an axillary branch, as in many other cases of apparently lateral inflorescence.

Water Blinks, Water Chickweed.

French, *Montie des Fontaines.* German, *Bach Montie.*

GENUS II.—CLAYTONIA. *Linn.*

Sepals 2 (rarely 3), free or united at the base, persistent, ovate. Petals 5, equal, generally notched or bifid at the apex, with the claws more or less united at the base. Stamens 5, inserted on the claws of the petals. Ovary free. Style 3-cleft. Capsule globose or ovoid, membranous, 3-valved, included in the calyx. Seeds 2 to 5, suborbicular-compressed, glabrous and somewhat succulent, often with long-stalked radical leaves and simple flowering stems, usually with a pair of opposite leaves, which are often connate at the base. Flowers white or rose-colour, in pseudo-racemes, which are sometimes branched.

This genus of plants was named in memory of Mr. J. Clayton, an American botanist, and correspondent of Gronovius.

SPECIES I.—CLAYTONIA PERFOLIATA. *Don.*

PLATE CCLX.

Bot. Mag. Tab. 1336.

Annual. Root leaves numerous, rhomboidal, fleshy, on long petioles. Stem leaves 2, united so as to resemble a single perfoliate leaf. Raceme with the flowers somewhat whorled, and often 1 or more separate flowers at the base. Petals entire or slightly notched, scarcely longer than the calyx.

A plant of western North America, but thoroughly naturalized in many places in England. At Weybridge and Woking, Surrey; Wanstead, Essex; Henfield, Sussex. Mr. Bentham also mentions its occurrence in Lancashire and Oxfordshire.

[England]. Annual. Spring and early Summer.

Plant growing in tufts, with very numerous radical leaves and several ascending flowering stems 4 to 12 inches high; these flowering stems have a pair of opposite connate leaves at the apex, sometimes more or less distinct, sometimes completely united. The flowers are at first almost sessile within this pair of leaves, but the axis of the raceme lengthens until it reaches to 1 or 2 inches above it. Pedicels about twice as long as the calyx. Sepals roundish-ovate. Petals a little longer than the sepals, white, not above ⅛ inch across. Capsule shorter than the sepals, sub-globular, with the valves rolling inwards after flowering. Seeds generally 1 in capsule, oval-roundish, black, shining, very slightly rugose. Plant bright green, brittle and succulent, quite glabrous.

Perfoliate Claytonia.

ORDER XIV.—TAMARICACEÆ.

Shrubs or under-shrubs, rarely small trees or tough-stemmed herbs. Leaves alternate, small, often scale-like. Stipules none. Flowers usually white or rose-colour, regular, and generally perfect, and disposed in small deciduous terminal spikes or racemes, but sometimes solitary or disposed in compact panicles Sepals 5 (rarely 4), free or united at the base, conspicuously imbricated. Petals as many as the sepals, imbricated, free or united into a tube at the base. Disk hypogynous or slightly perigynous, crenated or angulated. Stamens 5 or indefinite, inserted in the disk, free or united at the base. Ovary free, 1-celled, with 3 to 5 distinct placentæ. Styles as many as the placentæ, sometimes united or absent. Stigmas at the apex of the style or sessile. Ovules 2 or numerous on each placenta, anatropous. Capsule leathery, splitting into as many valves as there are styles. Seeds generally terminating in a tuft of hair or plumose beak, more rarely without a beak, and covered with long hairs, or having a membranous wing. Albumen farinaceous or somewhat fleshy, but most generally absent. Embryo straight, with the radicle near the hilum.

GENUS I.—TAMARIX. *Linn.*

Sepals 4 or 5 (rarely 6), free. Petals inserted beneath a crenate or lobed disk, free or slightly united at the base. Stamens

equal in number to the petals, or twice as many; free, or united only at the very base. Styles short, generally 3 or 4, feathery. Placentæ extremely short, with numerous ovules. Seeds small, numerous, without a beak, having a tuft of hair at the apex. Albumen none.

Shrubs or small trees with scale-like amplexicaul leaves and small white or rose-coloured flowers in spikes or dense racemes.

This genus of plants is named from a Hebrew word *tamarik*, abstersion, from the reputed qualities of some of the species for cleansing and purifying the blood, or from the fact of the branches being used as brooms. This is the derivation given by the best authorities: others say that the plant derived its name from the fact of its growing on the banks of the Tamaris, now Tambro, on the borders of the Pyrenees.

SPECIES I.—TAMARIX ANGLICA. *Webb.*

PLATE CCLXI.

Tamarix Gallica, *Sm.* Eng. Bot. No. 1318 (non *Linn.*).

Leaves quite glabrous, slightly narrowed towards the base. Flowers ovoid in bud. Sepals lanceolate. Disk with 5 acute angles, upon which the stamens are inserted. Anthers with a short apiculus. Capsule ovoid-pyramidal, 3-sided, suddenly narrowed towards the apex, and rounded at the base.

A native of the western coasts of the continent of Europe, but naturalized on the south coast of England.

[England]. Shrub or small Tree. Autumn.

An evergreen shrub or small tree from 3 to 10 feet high, with the bark of the main stem dull brown, but of the younger slender branches bright reddish brown. Leaves extremely minute, imbricated, slightly auricled at the base, and with the midrib produced backwards at the base into a short blunt spur. Racemes lateral and terminal, shortly stalked, 1 to 2 inches long, the flowers with scarious bracts at the base of each pedicel. Pedicels extremely short. Flowers crowded, white, tinged with pink, $\frac{1}{8}$ inch across. Petals oblong-oblanceolate, marcescent. The mature seeds I have not seen. Leaves bright lively green. An elegant shrub, in general appearance somewhat resembling the short-leaved junipers.

English Tamarisk.

French, *Tamarisque.* German, *Myrikarie.*

Those who have been on the Southern and Eastern coasts of England must have noticed this pretty evergreen shrub, sometimes almost the only green thing larger than a herb which is able to resist the cutting east winds and dashing sea-spray of an unprotected

shore. It forms hedges and little plantations close to the sea; and we can speak with certainty of its vigour and beauty at Felixstowe, in Suffolk, and the neighbouring coast, not only enlivening the eye with its bright green foliage, but adding its delicate little flowers to its other attractions till late in the year. Some remarkable specimens of aged trunks of this plant are still to be seen in the garden at Landguard Fort, at the extreme corner of the county of Suffolk, on the estuary of the Orwell. It is by no means confined to our English coasts, or to recent times. The Tamarisk was known to the Greeks by the name of μυρικη (*murike*), and to the Latins as *tamarix*. In France and in the South of Europe, in favourable situations, another species of this genus grows luxuriantly, and attains the height of fifteen or twenty feet; but there are instances both in Britain and the Continent of its attaining thirty feet. In Russia and the South of Tartary another species is very abundant, and a decoction of the young twigs is used by the Tartars in case of rheumatism and bruises: the handles of whips are made of the wood. In France and Italy it is greedily eaten by sheep, on account, perhaps, of its saltish taste. Mr. Loudon tells us that there is a shrub of Tamarisk in Lady Tankerville's garden at Walton-on-Thames which is thirty feet high. We can scarcely expect that our old herbalist ancestors, who were perhaps botanists in a crude state, should overlook the oriental name and reputation of this plant without finding great virtues in it. Dioscorides teacheth, according to Gerarde, that "the decoction of the leaves made with wine doth waste the spleen, and that the same is good against toothache;" both most valuable properties, could they be relied on. Gerarde confirms all that Dioscorides asserted about this plant, and adds a suggestion which has been revived in later days in the form of the "bitter cup," made of quassia wood, which we see in chemists' shops. He says: "If ale or beere be continually drunke forth of a cup or dish made of the wood or timber of Tamariske, it is of great efficacie."

ORDER XV.—ELATINACEÆ.

Creeping or diffuse aquatic herbs (or more rarely undershrubs), with opposite or verticellate entire or serrate leaves, with small scarious stipules. Flowers small, white or rose-colour, regular, perfect, axillary, solitary or in cymose fascicles. Sepals 2 to 5, free or slightly united at the base, imbricated, persistent. Petals as many as the sepals, hypogynous, free, imbricated. Disk none. Stamens as many as the petals (or twice as many), hypogynous, free. Anthers 2-celled. Ovary free, with as many cells as there are sepals. Styles as many as the cells of the ovary, short, with capitate stigmas. Placentæ on the inner angles of the cells. Ovules numerous, anatropous. Capsule with as many valves as there are styles, splitting away in a more or less septifragal manner from a central columella. Seeds straight or curved. Albumen none. Radicle near the hilum.

GENUS I.—ELATINE. *Linn.*

Flowers 3- or 4-merous, (rarely 2-merous). Sepals membranaceous, obtuse, not keeled. Stamens generally twice as many as the sepals. Ovary sub-globose. Capsule membranaceous. Seeds cylindrical, slightly arched or sharply hooked, with 6 or 8 longitudinal ridges and numerous transverse striæ.

Small aquatic glabrous plants, with opposite or verticellate slightly succulent leaves. Flowers very small, axillary, and generally solitary.

The name of this genus comes from the Greek word ελατινη (*elatine*), from ελάττων, smaller, given to Linaria Elatine on account of the small size. Other authors give the derivation from ελατη (*elate*), a fir-tree, from its fine leaves, which have been compared to those of a fir.

SPECIES I.—ELATINE HEXANDRA. *D.C.*

PLATE CCLXII.

Elatine paludosa, *Seub. Gr. & Godr.* Fl. de Fr. Vol. I. p. 278.
E. Hydropiper, var. β, *Linn. Sm.* Eng. Bot. No. 955.
E. tripetala, *Sm.* Eng. Fl. Vol. II. p. 243.

Stem prostrate, creeping. Leaves opposite, with the lamina longer than the petiole. Flowers alternate, axillary, stalked. Sepals 3, shorter than the petals, and about equal to the capsule. Petals 3. Stamens 6. Seeds ascending, nearly straight.

On mud at the bottom of ponds, or left dry by the evaporation of the water. Rather rare; but occurring in Cornwall, Sussex, Surrey, Berkshire, Warwickshire, Shropshire, Anglesea, Leicestershire, Cheshire, Perthshire, Kincardineshire, and Bute.

England, Scotland, Ireland. Annual. Autumn.

Stem branched, 1 to 3 inches long, emitting root-fibres from the nodes, which penetrate the mud in which the plant grows. Leaves opposite, oblanceolate, narrowed insensibly at the base into a petiole, which does not exceed the length of the lamina; apex obtuse. Flowers solitary, $\frac{1}{16}$ inch across, white. Peduncles usually shorter than the leaves. Sepals unequal, roundish, obtuse. Petals obovate, very little longer than the sepals. Capsule globular-turbinate, emarginate at the apex. Seeds 8 to 12 in each cell of the capsule, very slightly and regularly curved through their length, with rounded longitudinal ribs and very numerous transverse striæ. Whole plant pale yellowish green.

Hexandrous Waterwort.

French, *Élatine à Six Étamines.* German, *Sechsmänniger Sännel.*

SPECIES II.—ELATINE HYDROPIPER. *Linn.*

PLATE CCLXIII.

"E. Schkuriana, *Drev. & Hayne*, Tab. LXXI. Fig. 4," teste *Koch.*

Stem prostrate, creeping. Leaves opposite, with the laminæ equal to or shorter than the petiole. Flowers alternate, axillary, sessile. Sepals 4, shorter than the petals, and about equal to the capsule. Petals 4. Stamens 8. Seeds pendulous, hooked.

On mud at the bottom of ponds. Very rare. Near Farnham, Surrey; and Llyn-Coron, Anglesea (in both which places it grows with E. hexandra); Lagan canal, co. Antrim.

England, Ireland. Annual. Autumn.

This plant greatly resembles E. hexandra, but is generally a little larger and stouter in all its parts. The leaves have longer stalks, and are more abruptly narrowed into them; the sepals are narrower, the flowers sessile (or nearly so); but the most remarkable difference is in the seeds, which are sharply curved round a little more than half-way towards the tip, so as to resemble a horse-shoe with one side longer than the other. The flowers are said to be rose-colour; but I have not seen them in a recent state. The seeds, instead of ascending from the base of the placentas, hang down from their apex.

Octandrous Waterwort.

French, *Élatine Poivre d'Eau.* German, *Pfefferfrüchtiger Sünnel.*

ORDER XVI.—HYPERICACEÆ.

Perennial herbs, shrubs, or rarely trees, with the leaves generally opposite and entire, sessile or very shortly stalked, frequently marked with pellucid dots. Stipules none. Flowers nearly regular, perfect, yellow, or more rarely white, commonly in corymbose cymes, or not unfrequently disposed in panicles. Sepals 5 (rarely 4), imbricated, persistent. Petals as many as the sepals, hypogynous, æstivation usually imbricated, twisted. Stamens hypogynous, generally polyadelphous, united into 3 or 5 bundles. Anthers versatile, 2-celled. Ovary free, consisting of 3 to 5 carpels and as many cells, more rarely 1-celled, or very rarely reduced to

a single carpel. Styles as many as the carpels. Stigmas capitate. Placentæ on the inner angles of the dissepiments. Ovules generally numerous, anatropous. Fruit usually a capsule, with septicidal (or more rarely loculicidal) dehiscence, sometimes fleshy and indehiscent, very rarely dividing into cocca. Seeds small, cylindrical, straight. Embryo straight, rarely curved. Albumen none. Radicle near the hilum.

GENUS I.—HYPERICUM. *Linn.*

Sepals 5, free, or slightly combined at the base. Petals 5, glabrous on the inside. Stamens united at the base, so as to form 3 or 5 bundles, or more rarely with the filaments united for a great part of their length. Placentæ 3 to 5, projecting more or less into the cavity of the capsule, sometimes meeting and adhering together in the axis. Seeds not winged. Cotyledons usually shorter than the radicle.

Herbs or small shrubs, with the leaves generally sub-sessile, frequently with pellucid dots or veins. Flowers commonly yellow, with the petals often bordered or dotted with black glandular points.

According to the best authorities, the name of this genus of plants is derived from two Greek words, ὑπερ (*huper*), above, or superior; and εικων (*eikon*), an image, or spectre; because it was supposed to protect from evil spirits.

SECTION I.—ANDROSÆMINEÆ. *Spach.*

Calyx of 5 unequal sepals. Petals deciduous. Stamens generally in 5, rarely 4 bundles, generally deciduous, without having hypogynous glands or scales alternating with the bundles, in each of which the stamens adhere only by the base. Ovary 3- or 5-celled, with the placentas not united.

Plants with the stems often shrubby, at least towards the base. Flowers large, handsome, rather few.

SPECIES I.—HYPERICUM ANDROSÆMUM. *Linn.*

PLATE CCLXIV.

Androsæmum officinale, *All.* *Reich.* Ic. Fl. Germ. et Helv. Vol. VI. *Hyp.* Tab. CCCLII. Fig. 5192.

A. officinale, *Koch*, Syn. Fl. Germ. et Helv. ed. ii. p. 146.

Stem shrubby at the base; branches compressed. Leaves sessile, ovate, sub-cordate at the base, rather obtuse at the apex. Cymes

terminal, few flowered. Sepals unequal, oval or ovate, rather obtuse. Petals about as long as the sepals Stamens in 5 bundles, about as long as the petals. Ovary sub-globose. Styles 3, recurved, rather shorter than the ovary, and falling short of the stamens. Fruit a sub-globose pulpy berry before it is quite ripe, when it becomes dry, indehiscent, crowned by the three hooked styles, which are much shorter than the fruit.

In shady lanes and thickets. Rather rare, and probably only native in the South of England and West of Scotland, where, however, it reaches as far north as Ross-shire.

England, Scotland, Ireland. Shrub. Summer.

Stem erect or ascending, branched, 1 to 3 feet high, the lower part decidedly woody. Leaves opposite, 1 to 3 inches long, ovate, or lanceolate-ovate, scarcely acute, thickly sprinkled with very minute transparent dots. Cymes 3- to 12-flowered, umbellate, or corymbose. Pedicels equalling or exceeding the sepals. Flowers $\frac{3}{4}$ inch across, bright yellow. Sepals very unequal, arranged in two rows, the two outermost ones larger and broader than the inner ones; all obtuse at the apex, and sprinkled with small glands, but without black glands on the margins. Petals equal to or shorter than the sepals. Stamens a little longer than the petals. Styles short, abruptly hooked at the apex. Fruit a purplish-black pulpy berry, but becoming nearly dry when it is quite ripe, imperfectly 3-celled, with the placentas distinct. Plant glabrous, with the leaves yellowish green, pale and slightly glaucous beneath, frequently tinged with red.

Tutsan.

French, *Androsème Officinale.* German, *Konrad's Kraut.*

The specific name of this species of St. John's Wort is said to be derived from the two Greek words signifying man and blood, in allusion to the dark-red juice which exudes from the capsules when bruised. In accordance, therefore, with the "doctrine of signatures," which regulated in many instances the practice of the ancient physicians, the plant was applied to external wounds, sometimes, no doubt, with success, for the whole tribe possesses stringent properties. One old practitioner calls the Tutsan "Balm of the warrior's wound." The name Tutsan comes from the French, "Toute-saine," "All-heal," on account of its medicinal reputation. It is also called "Park Leaves," from being found in parks; and in old English, "St. Peter's Wort." Gerarde informs us that the bruised leaves are good for burns; that a decoction of the seeds drunk for forty days will take away agues, and cure sciatica. He adds: "The leaves laid upon broken shins and scabbed legs heal them and many other hurts and griefs, whereof it took its name 'Toute-saine,' of healing all things." In more modern times, the plant has been recommended as a febrifuge; but, notwithstanding the slightly astringent properties it possesses, we incline to agree with the somewhat cynical lines which say,—

"But this is only sweet and delicate,
Fit for young women, and is like the Herb St. John,
Doth neither good nor hurt; but that's all one;
For if they but conceive it doth, it doth;
And it is that physicians hold the chief
In all their cures,—conceit and strong belief."

SPECIES II.—HYPERICUM ELATUM. *Ait.*

PLATE CCLXV.

H. grandifolium, *Choisy. Reich.* Ic. Fl. Germ. et Helv. Vol. VI. *Hyp.* Tab. CCCLII. Fig. 5193?
H. anglicum, *Bertol. Bab.* Man. Brit. Bot. ed. v. p. 60.
H. Androsæmum, *Sm.* Eng. Bot. No. 1225 (non *Linn.*).
Androsæmum parviflorum, *Spach.* Arnott, in Brit. Fl. ed. viii. p. 604.

Stem shrubby, branched; branches 2-edged. Leaves sessile, broadly lanceolate, sub-cordate at the base, sub-acute at the apex. Cymes terminal, few-flowered. Sepals oval or ovate, acute, persistent and reflexed after flowering. Petals longer than the sepals. Stamens in 5 bundles, as long as the petals. Ovary ovoid. Styles 3, nearly straight, longer than the ovary, and surpassing the stamens. Fruit conical-ovoid, slightly fleshy before maturity, at length opening by 3 valves at the apex, crowned by the 3 nearly straight or slightly hooked styles, which are longer than the fruit.

In hedges and shrubby places, in the South-West of England and West of Scotland; but probably not native. Professor Babington states that he has it from Falmouth, Cornwall; and the figure in "English Botany" was drawn from a plant found in Haughley woods, Norfolk. I have specimens from Arran (Dr. P. W. Maclagan) and Torquay, Devon (Mr. Eyre Parker). Dr. Arnott, in the "British Flora," gives the following localities:—"Cliff above Falmouth Harbour; Helston, near Falmouth; Hills behind Greenock; Crinan Canal, Argyleshire; Culross, Perthshire; Arran, Scotland; Galway; Donard Lodge, co. Down, Ireland."

[England, Scotland, Ireland]. Shrub. Summer.

This plant has been long passed over as H. Androsæmum, from which, however, it is sufficiently distinct. It is usually a taller plant, with more decidedly shrubby stems, with the leaves longer in proportion, and tapering to an almost acute point. The flowers are more numerous, with the sepals smaller and more acute; the petals and stamens also longer; but the very long styles form the most striking character.

Professor Babington doubts if the plant intended by Dr. Arnott be the same as his H. anglicum; but in any case the "English Botany" plant is doubtless H. elatum.

Tall St. John's Wort.

SPECIES III.—HYPERICUM HIRCINUM. *Linn.*

PLATE CCLXVI.

Androsæmum fœtidum, *Spach.* Suites à Buffon, Vol. V. p. 419.

Stem shrubby, branched, with the branches quadrangular. Leaves sessile, lanceolate, sub-cordate at the base, acute at the apex. Cymes terminal, few-flowered. Sepals unequal, lanceolate or oblong-lanceolate, very acute, deciduous after flowering. Petals much longer than the sepals. Stamens in 5 bundles, longer than the petals. Ovary ovoid. Styles 3, nearly straight, much longer than the ovary, but falling short of the stamens. Fruit obovate-ovoid, slightly fleshy before maturity, at length opening by 3 valves at the apex, crowned by 3 nearly straight or slightly hooked styles, which are longer than the fruit.

In thickets and woods, but only where it has been planted. The drawing made for "English Botany," which is now published for the first time, was made from a plant growing in Haughley woods, Norfolk, the locality where H. elatum was found. I have it also from Liverpool, Cork, Kent, and several other places.

[England, Ireland]. Shrub. Summer.

This plant is so frequently confounded with H. elatum, that it has been considered better to figure and describe it, although there is no doubt that it has been planted in all the localities in which it occurs. It forms a bush 1 to 4 feet high, with very numerous branches. The leaves are generally about 2 inches long, and very acute at the apex. The flowers are $1\frac{1}{4}$ to $1\frac{1}{2}$ inch across, with the stamens considerably longer than in H. elatum, and the germen and fruit taper less towards the point; and the small narrow acute sepals usually, though not always, drop off before the fruit is mature. The smell of the bruised plant is extremely unpleasant, resembling that of a goat, while in the preceding species the odour is rather agreeable and aromatic.

Stinking St. John's Wort.

French, *Millepertuis Sousligneux.*

SPECIES IV.—HYPERICUM CALYCINUM. *Linn.*

PLATE CCLXVII.

Stem simple or slightly branched at the base, where it is woody; branches quadrangular. Leaves sessile or sub-sessile, elliptical or lanceolate-oblong, rounded at the base, and scarcely acute at the apex. Cyme terminal, almost always reduced to a single flower. Sepals unequal, broadly oval, rounded at the apex, persistent. Petals much longer than the sepals. Stamens in 5 bundles, as long as the petals. Styles 5, straight, longer than the ovary, but falling short of the stamens. Fruit ovoid-pyramidal, leathery, 5-valved, crowned by the 5 styles which are longer than the capsules.

On roadsides and in thickets in many places.

England, Scotland, Ireland. Shrub. Autumn.

Rootstock extensively creeping, sending up erect stems which are generally simple, 6 inches to 1 foot high, with a few pairs of closely-placed leathery leaves 2 to 4 inches long, covered with rather large pellucid dots. Flowers on peduncles shorter than the longest sepals, 3 to 4 inches across, very bright yellow, without black glands. Outer sepals shorter than the inner ones, and roundish; the 3 inner ones obovate-oval. Petals slightly oblique, frequently slightly lobed towards the apex. Stamens very numerous, a little shorter than the petals. Capsule 5-celled towards the base, with the placentas contiguous. The very large flowers, with 5 styles, distinguish this from all the other species of the genus. By means of its creeping roots, this plant rapidly extends itself wherever it is introduced, so that it quite assumes a wild appearance, although it is really a native of the Levant.

Large-flowered St. John's Wort, Aaron's Beard.

This species is often cultivated in gardens.

SECTION II.—HYPERINEÆ. *Spach.*

Calyx 5-partite, or more rarely with the sepals distinct to the base. Petals persistent, withering. Stamens persistent, in 3 bundles, without scales or glands alternating with the bundles. Filaments adhere only by the very base. Ovary 3-celled, with the placentas in the centre, and united together. Styles 3. Capsules 3-valved.

The British species of this group are all herbaceous, with the cymes of flowers commonly numerous, and united so as to form a panicle or corymb.

SPECIES V.—HYPERICUM PERFORATUM. *Linn.*

PLATE CCLXVIII.

Reich. Ic. Fl. Germ. et Helv. Vol. VI. *Hyp.* Tab. CCCXLIII. Fig. 5177.

Stems stout, erect, corymbosely or paniculately branched, marked with two longitudinal elevated lines. Leaves oblong, more or less thickly marked with small pellucid dots, and having the principal nerves also pellucid, appearing as semi-transparent lines when viewed against the light, but not anastomosing. Flowers numerous, in small dense cymes arranged in a rather lax corymb or short panicle. Sepals slightly unequal, lanceolate, acute, entire, or with very inconspicuous cartilaginous denticulations towards the apex, nearly destitute of black dots. Petals generally furnished with black dots. Styles as long as the capsule. Capsule with each valve having 2 vittæ or bands containing essential oil on the back.

Var. *α*, *genuina*.

H. perforatum, *Jord.* *Boreau*, Fl. du Centre de la Fr. ed. iii. Vol. II. p. 123.

Leaves elliptical-oblong.

Var. *β*, *angustifolium*.

H. microphyllum, *Jord.* *Boreau*, Fl. du Centre de la Fr. ed. iii. Vol. II. p. 124.

Leaves strapshaped-oblong.

In bushy places and in hedgebanks and chalky hills. Common in England and the South of Scotland; but rare in the Highlands and Northern part of the latter country. Var. *β* appears to be not uncommon.

England, Scotland, Ireland. Perennial. Late Summer.

Stem 1 to 3 feet high, emitting roots only at the very base, erect or ascending, wiry, each internode furnished with two opposite elevated lines, one coming from the base of each of the leaves which spring from the apices of the internodes, and which consequently change sides at each node. Leaves $\frac{1}{2}$ to $1\frac{1}{2}$ inch long, varying much in breadth and in the number of pellucid dots. Lateral branches generally numerous, ascending, the upper ones terminating in small compact cymes of bright yellow flowers, about 1 to $1\frac{1}{4}$ inch across; these cymes are generally arranged in a corymb, but sometimes form a short panicle, the difference depending on

the relative length of the lateral branches. Sepals narrow, without conspicuous marginal denticulations. Petals much longer than the sepals, oblique. Stamens rather shorter than the petals, in 3 bundles, as in the other species under this section. Capsule pyramidal, splitting into 3 valves; each valve with 2 longitudinal raised lines on the back, and oblique oblong pellucid spaces on the margins. Plant light green, more or less dotted with black glands on the under side of the leaves and upper part of the stem.

H. lineolatum Jord. (Boreau, l. c., p. 123) is a form (scarcely deserving the name of a variety) in which the black glands on the petals coalesce into longitudinal bands. I am favoured by Mr. J. G. Baker with specimens of this form from Thirsk, Yorkshire, and with these I find that some collected by myself at Musselburgh perfectly agree.

Dotted-leaved St. John's Wort.

French, *Millepertuis Perforé.* German, *Durchbochertes Harthen,* or *Johannis Kraut.*

In Wales it is called "Thousand Holes." and in Kent "Amber." In the days of necromancy and witchcraft the St. John's Wort was a most important plant, for it was considered not only a sovereign remedy against all diseases produced by such means, but a sure preventive of all evil resulting from the machinations of witches, demons, or magicians. Dedicating the plant to St. John the Baptist, on whose night demons were supposed to be unusually active, people of old summed up all which they believed it to be capable of effecting in the single name of the "grace of God." Old writers tell us that on the Eve of St. John "every man's door was shadowed with green birch, fennel, white lilies, and such like." Lamps were kept burning within all night long, and garlands of the magic plant were carefully preserved throughout the year to secure the general prosperity of the inmates. In the Pyrenees it is said to be still so used; and in Lightfoot's time the Highlanders carried it about with them and stirred milk with it that was difficult to churn from some supposed witchery. The holes in the leaves were said to be made by witches, out of spite to the inconvenient virtues of the plant. The old name, "Fuga Dæmonum," given to the St. John's Wort, arose from its fancied medicinal powers in dispelling melancholy and mental delusions. Buxton says: "Gathered upon a Friday, in the hour of Jupiter, when he comes to his effectual operation, so gathered or borne, or hung about the neck, it mightily helps this affliction, and drives away all phantastical spirits." It was in high repute as a vulnerary. Gerarde says: "A balsaam prepared from it is a most precious remedie for deep wounds, and those that are thorow the body, for the sinues that are prickt, or any wound made with a venomed weapon." Thereupon he proceeds to give the prescription for the concoction of this precious balsam. Dioscorides says: "The seed drunke for the space of forty daies together cureth the sciatica and all aches that happen in the hips." The plant is certainly astringent and aromatic; taken internally, it occasionally acts as a purgative, but not powerfully. In country districts it is sometimes used still as a medicine, and oil in which the shoots or flowering tops have been steeped is sold by herbalists as "oleum hyperiæ." The leaves have been used as a vermifuge. In Wales, the St. John's Wort is still regarded by many with superstitious reverence, either for its medicinal or anti-demoniac qualities, and the peasantry call it "y Fendigedi," "the blessed." It was formerly carried about as an amulet by

the Scottish Highlanders, and forms the badge of the McKinnon clan to this day. Other powers were also attributed to the St. John's Wort than those already described; and there is a superstition in Lower Saxony, that if the plant be gathered on Midsummer night by the maidens of a district, and hung up in their bedchambers, the fresh or withered appearance of the plant in the morning will show whether they are to become brides in the ensuing year. We cannot refrain from quoting some lines, translated from the German, relating to this custom, which resembles the practices on Hallow E'en in Scotland :—

"The young maid stole through the cottage door,
And blushed as she sought the plant of power.
'Thou silver glow-worm, oh! lend me thy light,
I must gather the mystic St. John's Wort to-night;
The wonderful herb whose leaf will decide
If the coming year shall see me a bride.'
And the glow-worm came,
With its silvery flame,
And sparkled and shone
Through the night of St. John,
And soon has the young maid her love-knot tied.
With noiseless tread
To her chamber she sped,
Where the spectral moon her white beams shed.
'Bloom here, bloom here, thou plant of power,
To deck the young maid in her bridal hour.'
But it droop'd its head, that plant of power,
And died the mute death of the voiceless flower;
And a wither'd wreath on the ground it lay,
More meet for a burial than bridal day.
And when a year was pass'd away,
All pale on her bier the young maid lay.
And the glow-worm came,
With its silvery flame,
And sparkled and shone
Through the night of St. John,
As they closed the cold grave o'er the maid's cold clay."

There are other superstitions connected with the Eve of St. John, all of which are more or less associated with the vegetable world,—such as throwing a garland on a stream, in order to ascertain whether the maker will be successful in love; or seeking for the seed of the fern, which it was believed could only be secured on this night, and would, when possessed, render the wearer invisible :—

"I have the recipe of fearn seed;
I walk invisible."

Although the belief in the supernatural powers of the St. John's Wort has disappeared with that in the beings over whom it was supposed to exert an influence, and although its medicinal virtues are in a great measure imaginary, it has yet some claim to be considered a useful plant, from the red or yellow dye yielded by its flower-buds and young shoots. Steeped in water or alcohol, the buds give out a fine blood-red

colour, and yield in acetic acid a crimson colour; when boiled with alum, the tops yield a good yellow dye; the addition of chloride of tin to the juice gives several shades of red. Combined with oil of turpentine and linseed oil, this juice also furnishes an excellent red varnish, which is frequently used by upholsterers for colouring woods.

SPECIES VI.—HYPERICUM DUBIUM. *Leers.*

PLATE CCLXIX.

H. quadrangulum, "*Linn.*" *Reich.* Ic. Fl. Germ. et Helv. Vol. VI. *Hyp.* Tab. CCCXLIII. Fig. 5178.

H. quadrangulum, "*Linn.*" *Fries.* Nov. Fl. Suec. ed. ii. p. 237. *Koch*, Syn. Fl. Germ. et Helv. ed. ii. p. 146. *Gr.* & *Godr.* Fl. de Fr. Vol. I. p. 344.

Rootstock woody. Stem slightly woody and emitting a few rootlets at the base, stout, erect, corymbosely or paniculately branched, marked with 4 longitudinal elevated lines (at least in the upper part). Leaves oval or oval-oblong, those of the main stem slightly amplexicaul at the base; all destitute of pellucid dots (or with a few on the upper leaves), and with all the nerves and veins pellucid, forming a network when viewed against the light. Flowers rather numerous, in compact cymes, arranged in a corymb or short panicle with elongated branches. Sepals (or at least the exterior ones) oval-ovate, obtuse, entire (more rarely lanceolate, and with very small cartilaginous denticulations towards the apex), and generally dotted with black glands on the disk. Petals generally furnished with black dots. Styles 3, about as long as the capsule. Capsule with each valve having numerous vittæ on the back.

Var. α, *genuinum.*

Sepals broad, entire.

Var. β, *maculatum.*

H. maculatum, *Bab.* (olim).

Sepals narrow, slightly denticulate. Leaves narrower than in var. α.

In bushy places and by the sides of ditches. Rather rare, but pretty generally distributed in England and the southern half of Scotland.

England, Scotland, Ireland. Perennial. Late Summer and Autumn.

This plant is frequently confounded with H. perforatum, and some intermediate forms certainly occur, which have been considered

to represent a third species, H. maculatum, though the plant intended by Professor Babington under that name is doubtless a form of H. dubium, with the sepals narrower than usual. The pellucid network formed by the veins of the leaves in this species is the best character by which to separate it from H. perforatum, but it can generally be recognized by the broader leaves destitute of pellucid dots, by the broader and blunter sepals which are spreading, or even reflexed in fruit, by the rather smaller flowers, the shorter capsule with styles shorter in proportion, by the valves having more than 2 longitudinal vittæ, and by the stem with 4 raised lines instead of only 2.

Imperforate St. John's Wort.

French, *Millepertuis Douteux.* German, *Vierkantiges Harthen.*

SPECIES VII.—HYPERICUM TETRAPTERUM. *Fries.*

PLATE CCLXX.

Reich. Ic. Fl. Germ. et Helv. Vol. VI. *Hyp.* Tab. CCCXLIV. Fig. 5179.

Fries, Nov. Fl. Suec. ed. ii. p. 236. *Koch,* Syn. Fl. Germ. et Helv. ed. ii. p. 147. *Gr. & Godr.* Fl. de Fr. Vol. I. p. 314.

H. quadrangulum, "*Linn.*" *Sm.* Eng. Bot. No. 370. *Bab.* Man. Brit. Bot. ed. v. p. 61. *Hook. & Arn.* Brit. Fl. ed. viii. p. 81. *Benth.* Handbook Brit. Fl. p. 134.

Rootstock woody. Stems slightly woody and rooting at the base, stout, erect, paniculately branched, marked with 4 longitudinal elevated lines, each of which is raised so as to form a narrow wing which is most apparent towards the top of the stem. Leaves broadly oval or oblong-oval, entire at the margins, those of the main stem semi-amplexicaul at the base, all with pellucid dots and with all the nerves and veins pellucid, forming a network when viewed against the light. Flowers numerous, in compact cymes arranged in a small dense corymb or contracted panicle. Sepals elliptical-lanceolate, acuminate, with subulate points, entire, generally without black glands. Petals pale yellow, concolorous, with only a few black dots round the margin. Styles 3, shorter than the capsule. Capsule with each valve having numerous vittæ on the back.

In wet places by the sides of ditches, etc. Common, and generally distributed except in the extreme North of Scotland.

England, Scotland, Ireland. Perennial. Late Summer.

This species is readily distinguishable from H. dubium by the stem having 4 wings instead of 4 merely raised lines, a compact inflorescence and also by the much smaller flowers, which are about ½ inch across and pale yellow; the sepals are also much more

acuminated and have subulate points. The base of the stem is more decidedly rooting than in H. perforatum or dubium. The leaves are intermediate between those of the two last-named species in the arrangement of the dots and veins, the pellucid network is not so distinct as in H. dubium but much more so than in H. perforatum; in shape, although variable, they are generally shorter, blunter, and broader than in either. The styles are also shorter than in either of these species, but in the marking of the capsule it resembles H. dubium. The odour is slightly fetid.

There can be no doubt that Linnæus under his Hypericum quadrangulum included both H. dubium (Leers) and H. tetrapterum (Fries); and as botanists are pretty equally divided in their opinion as to which of these two ought to receive the name "quadrangulum," it is much better to abandon an appellation which really belongs to neither exclusively, when the two plants have distinctive names of their own. In the Linnæan Herbarium, H. quadrangulum is represented by a specimen of each of the two species; and that being the case, it is of no use trying to determine to which of the two he first gave the name of quadrangulum, or which is the common Swedish plant; there is evidence to show that he considered the species extensive enough to include both.

Square-stemmed St. John's Wort.

French, *Millepertuis à Quatre Ailes.* German, *Vierflügeliges Harthen.*

SPECIES VIII.—HYPERICUM BŒTICUM. *Boiss.*

PLATE CCLXX. (*bis*).

Boissier, Voy. en Espagne. Tab. XXXIV.
Boiss. "Elen. No. 40," Voy. en Esp. p. 114.
H. decipiens, *Watson*, in Hook. Jour. of Bot. Ser. II. Vol. III. p. 588.
H. "undulatum, *Schousb.* apud *Willd.*" *Reich.* (?) Ic. Bot. Ex. Cent. I. Tab. XXXIX. p. 27.
H. quadrangulum, var. ε, undulatum, *D. C.* (?) Prod. Vol. I. p. 548.

Rootstock woody. Stems slightly woody and extensively rooting at the base, stout, erect, paniculately branched, marked with 4 longitudinal elevated lines, each of which is raised so as to form a narrow wing, which is most apparent towards the top of the stem. Leaves broadly-oval or oblong-oval, with the margins slightly waved; those of the main stem semi-amplexicaul at the base; all with pellucid dots, and with all the nerves and veins pellucid, forming a network when viewed against the light. Flowers rather numerous, in regular lax forked cymes arranged in a loose panicle with very long lateral branches. Sepals ovate-lanceolate, acuminate with the points almost subulate, entire, with a few black glands.

Petals bright yellow, tinged with red on the back, with only a few black dots round the margin. Styles 3, shorter than the capsule. Capsule with each valve having numerous vittæ on the back.

In boggy places. Found by Mr. T. R. Archer Briggs in August last (1863), in three situations near Plymouth, growing with Osmunda regalis. Especially abundant by the banks of the stream between Common and Fancy Woods.

England. Perennial. Late Summer and Autumn.

Mr. J. G. Baker, who at once saw that this Hypericum was distinct from all the known British species, has kindly furnished me with the following description, drawn up by him for the Report of the Thirsk Botanical Club for 1863 :—

"Rootstock creeping widely. Stems 2 to 3 feet high, slender, with 4 slightly-winged angles. Leaves oblong or oval, amplexicaul, thickly studded with pellucid dots and with a network of pellucid veins. Panicle loosely corymbose, the long lateral branches often with only 2 or 3 flowers. Sepals always erect, lanceolate, acute or bluntish, with pellucid veins and dots and sometimes (but not always) with black dots on the back and along the edges. Petals elliptical or obovate, as large as those of H. perforatum, tinged with red on the outside, slightly dotted with black on the edges. Styles about as long as the ovary, in the fully-expanded flowers half as long as the capsules.

"Differs from H. perforatum by its quadrangular stem, broader leaves with network of pellucid veins, broader and blunter sepals, and styles only half as long as capsule; from H. dubium by its closely-dotted leaves and erect sepals; from H. quadrangulum (tetrapterum) by its less robust and less decidedly winged stem, more dotted leaves, larger petals, and differently shaped sepals; and from all three by the much fewer and more distantly placed flowers of the panicle."

On showing the plant to Mr. Hewett C. Watson, he recognized it as the species found in the Azores, which he described under the name of H. decipiens; a plant, however, that had been previously discovered in Spain by M. Boissier, and named by him H. bœticum. Afterwards my attention was directed by Dr. Seeman to the figure of H. undulatum, in Reichenbach's "First Century of Figures of Exotic Plants;" and I have no doubt that the plant there represented is the same as that from Devonshire. The name bœticum is, however, in general use, so that it appears unwise to discard it for the doubtful one of undulatum, as some authorities entertain suspicions that the two names belong to two distinct plants.

The habit of the present species is intermediate between that of H. tetrapterum and H. pulchrum, though it has nothing in common

with the latter except the long slender lateral branches of the panicle and the red-tinged petals.

The plant produces a number of barren shoots from the base of the stem with smaller, rounder, and less distant leaves than those of the flowering stem.

The plate is drawn by Mr. Sowerby from a fine specimen kindly sent for the purpose by Mr. Briggs, to whom I am also indebted for living roots, by the cultivation of which a more complete knowledge of the plant may be obtained.

Waved-leaved St. John's Wort.

SPECIES IX.—HYPERICUM HUMIFUSUM. *Linn.*

PLATE CCLXXI.

Reich. Ic. Fl. Germ. et Helv. Vol. VI. *Hyp.* Tab. CCCXLII. Fig. 5176.

Rootstock woody. Stems numerous, slender, decumbent or procumbent, but not rooting at the base, nearly simple, marked with two elevated lines. Leaves oval or oblong, sessile, with or without pellucid dots, and only the principal veins or nerves pellucid. Flowers few, in terminal forked cymes, sometimes with a few branches underneath so as to form a short panicle. Sepals very unequal; three of them oval or broadly elliptical, obtuse; two lanceolate, sub-acute; all entire or with a few gland-tipped ciliæ towards the apex, and commonly a few black dots on the disk. Petals not twice as long as the sepals, with black dots on the margins. Styles 3, much shorter than the capsule. Capsule not twice as long as the sepals, with each valve having numerous vittæ on the back.

In dry pastures and on commons and roadsides. Common and generally distributed, except in the extreme North of Scotland.

England, Scotland, Ireland. Perennial. Late Summer.

Rootstock very short, woody, producing at the apex numerous decumbent stems spreading in a circle and curving upwards at the apex, 2 inches to 1 foot long. Leaves numerous, $\frac{1}{4}$ to $\frac{1}{2}$ inch long, varying in breadth as in the other species of the genus, and with black dots round the margins. Flowers 3 to 20 on each stem, $\frac{3}{8}$ to $\frac{1}{2}$ inch across, bright yellow. Capsule about half as long again as the sepals. Plant glabrous, light yellowish-green frequently tinged with red.

The small flowers and threadlike decumbent stems at once distinguish H. humifusum from all the preceding.

Trailing St. John's Wort.

French, *Millepertuis Couché.* German, *Niederliegendes Harthen.*

This is perhaps the most elegant species of the genus. It creeps with its pretty bright blossoms over dry and desolate districts, on arid stone walls, on boggy pastures, or on broken or gravelly ground, as if all places were alike to it, so that it may but weave its slender stems and golden stars into the fair tapestry that clothes the earth.

SPECIES X.—HYPERICUM LINARIIFOLIUM. *Vill.*

PLATE CCLXXII.

Reich. Ic. Fl. Germ. et Helv. Vol. VI. *Hyp.* Tab. CCCI. Fig. 5190*b*.

Rootstock woody. Stems generally numerous, rather slender, erect from a decumbent base, nearly simple, with 2 scarcely perceptible elevated lines. Leaves oblong-strapshaped (or the lower ones oblong), sessile, with a few pellucid dots, and only the principal veins or nerves pellucid. Flowers few, in terminal forked cymes or short flat-topped panicles. Sepals slightly unequal, lanceolate or strap-shaped, ciliated at the edge with thick gland-tipped hairs with black glands on the disk. Petals more than twice as long as the sepals, with black dots along the margins. Styles nearly as long as the capsule. Capsule quite twice as long as the sepals, with each valve having numerous vittæ on the back.

On dry rocky banks. Rare. Cape Carwall, and on the banks of the Teign, Tamar, and Tavey, Devon; also in the Channel Islands.

England. Perennial. Early Summer.

Stems wiry, 3 to 15 inches high, nearly cylindrical, having the raised lines indistinct, and indeed only visible towards the top. Leaves crowded (except at the top of the stem), $\frac{1}{2}$ to $1\frac{1}{4}$ inch long, obtuse at the apex, those on the barren shoots and base of the stem broadest. Flowers $\frac{1}{2}$ to $\frac{3}{4}$ inch across, bright yellow. Stamens a little shorter than the petals. Plant deep green, often tinged with red towards the base.

In ordinary states this plant cannot be confounded with any of the other British species; but in Jersey, at Noirmont Point, I found growing with it a plant strangely intermediate between this species and H. humifusum, some specimens approaching to the one and some to the other. Most of these forms are no doubt the Hypericum decumbens of Petermann, which is H. humifusum with the margins of the sepals ciliated; but some of the examples appear to be truly H. linariifolium, but with decumbent stems, and the leaves broader than usual though still crowded and diminishing in size towards the top of the stem more than is the case with those of H. humifusum.

Linaria-leaved St. John's Wort.

French, *Millepertuis à Feuilles Linéaires.*

SPECIES XI.—HYPERICUM PULCHRUM. *Linn.*

PLATES CCLXXIII.

Reich. Ic. Fl. Germ. et Helv. Vol. VI. *Hyp.* Tab. CCCXLVII. Fig. 5185.

Rootstock woody. Stems slightly woody but not rooting at the base, rather numerous, slender, erect from a decumbent base, paniculately branched, without elevated leaves, glabrous. Stem leaves ovate, sub-cordate, and amplexicaul at the base; those of the branches oval or broadly elliptical, sessile; all glabrous, with pellucid dots, and only the primary nerves pellucid. Flowers rather few, in cymes arranged in a slender pyramidal panicle, with sub-erect lateral branches, much longer than the leaves from which they spring. Sepals oval or elliptical, oblong, obtuse, bordered with dark-coloured sessile glands. Petals more than twice as long as the sepals, bordered with dark-coloured glands. Styles shorter than the capsule. Capsule about twice as long as the sepals, with each valve marked with several vittæ.

On commons and dry heaths and in bushy places. Common and generally distributed, except in the extreme North of Scotland.

England, Scotland, Ireland. Perennial. Summer.

Stems wiry, round, 1 to 2 feet high, with short lateral branches from the axils of the leaves. Stem leaves distant, $\frac{1}{2}$ to $\frac{3}{4}$ inch long, triangular-ovate with the base decidedly cordate; those of the branches smaller and rounded at the base. Panicle long and narrow. Flowers $\frac{1}{2}$ to $\frac{5}{8}$ inch across, bright yellow, often tinged with red on the outside. Leaves rather thick and shining, deep green above, paler and more glaucous beneath. Whole plant glabrous, often tinged with red. The distant stem leaves and slender elongated panicle distinguish this species at first sight from all the preceding.

Small Upright St. John's Wort.

French, *Millepertuis Beau.* German, *Schönes Harthen.*

SPECIES XII.—HYPERICUM HIRSUTUM. *Linn.*

PLATE CCLXXIV.

Reich. Ic. Fl. Germ. et Helv. Vol. VI. *Hyp.* Tab. CCCXLIX. Fig. 5189.

Rootstock woody. Stems woody and slightly rooting at the base, numerous, stout, erect from a decumbent base, paniculately branched, round, hairy. Leaves elliptical or oval, sessile, finely hairy, with pellucid dots but no pellucid nerves or veins. Flowers

rather numerous, in cymes arranged in a compact elongated sub-cylindrical panicle with ascending lateral branches, the lower ones scarcely exceeding the leaves from which they spring. Sepals slightly unequal, narrowly elliptical, rather acute, bordered with dark-coloured stalked glands. Petals more than twice as long as the sepals, with a few black dots at the apex. Styles about as long as the capsule. Capsule about twice as long as the calyx, with each valve marked with several vittæ.

In woods and bushy places. Rather common, and generally distributed, except in the extreme North of Scotland.

England, Scotland, Ireland. Perennial. Summer.

Stems $1\frac{1}{2}$ to $3\frac{1}{2}$ feet high, stouter than many of the preceding species, densely leafy up to the panicle, generally with numerous axillary branches. Leaves 1 to 2 inches long. Bracts (or leaves from which the branches spring) similar to the others, but smaller. Flowers pale yellow, $\frac{3}{4}$ inch across. Leaves rather thick, dull green, pale beneath, without marginal black dots. Whole plant covered with short hairs, those of the stem curled like wool.

The upright stems, slender compact panicle, and general hairiness, distinguish this from all the other British species.

Hairy St. John's Wort.

French, *Millepertuis Velu.* German, *Rauhhaariges Harthen.*

SPECIES XIII.—HYPERICUM MONTANUM. *Linn.*

PLATE CCLXXV.

Reich. Ic. Fl. Germ. et Helv. Vol. VI. *Hyp.* Tab. CCCXLVII. Fig. 5187.

Rootstock woody. Stems woody, scarcely rooting at the base, erect, nearly simple, round, glabrous. Leaves oval or elliptical, the uppermost lanceolate, those towards the base of the stem sessile, the others sub-cordate and semi-amplexicaul at the base, the uppermost only with a few pellucid dots, but all with the veins opaque. Flowers rather few, in a short oblong or densely corymbose panicle with ascending lateral branches, the lateral ones much longer than the leaves from which they spring. Sepals slightly unequal, narrowly lanceolate, very acute, with tooth-like hairs tipped by black glands on the margins. Petals scarcely twice as long as the sepals, nearly destitute of black dots. Styles scarcely as long as the capsule. Capsule only slightly exceeding the calyx, and with each valve marked with several vittæ.

In woods, copses, and bushy hedgebanks; partial to a chalky

soil. Rather rare, and not extending North of Cumberland and Durham.

England. Perennial. Summer.

Stem stiff and wiry, 1½ to 3½ feet high, with the leaves distant in the upper part and remote on the panicle. Leaves 1¼ to 3 inches long. Bracts much narrower than the uppermost pair of leaves, and often fringed with stalked glands like the sepals. Flowers in cymose fascicles, frequently forming a single terminal corymb; but in large specimens there are branches at some distance lower down, so that the form of inflorescence becomes distinctly paniculate. Flowers pale yellow, ½ to ¾ inch across. Leaves very thin, delicate green, with black marginal dots. Plant glabrous, except the leaves, which are generally roughened with small prominent points beneath.

This species may be easily recognized by its smooth tender green leaves rather crowded in the middle of the stem, but very distant in the upper half. The absence of hairs is quite sufficient to distinguish it from H. hirsutum, which has, nevertheless, sometimes been mistaken for it.

Mountain St. John's Wort.

French, *Millepertuis de Montagne.* German, *Berg Harthen.*

Section III.—ELODES. *Spach.*

Calyx 5-partite, with the sepals nearly equal. Petals persistent, withering. Stamens persistent, in 3 bundles, which alternate with small bifid hypogynous scales. Filaments adhering at the base by a considerable portion of their length. Ovary 3-celled, with the placentæ parietal, not contiguous. Styles 3. Capsule 3-valved.

A section which rather deserves to be considered as a sub-genus, and contains only a single species.

Species XIV.—HYPERICUM ELODES. *Linn.*

Plate CCLXXVI.

Elodes palustris, *Spach.* *Reich.* Ic. Fl. Germ. et Helv. Vol. VI. *Hyp.* Tab. CCCXLII. Fig. 5182.

Rootstock slender, fleshy, creeping. Stem weak, procumbent or ascending, creeping at the base (to which portion the branching is generally confined), round, hairy. Leaves roundish or oval, cordate and semi-amplexicaul at the base, more or less thickly clothed with woolly hairs, and closely sprinkled with small pellucid dots. Flowers few, in a terminal irregularly dichotomous cyme.

Sepals elliptical-oblong, obtuse at the apex, fringed with crimson stalked glands. Petals three times as long as the sepals, without black dots. Styles shorter than the capsule. Capsule scarcely twice as long as the sepals, with each valve marked with several vittæ.

In spongy bogs and shallow ditches and drains in moory ground. Rather common in the South of England and West of Scotland, though absent from the East of Scotland and North-East of England.

England, Scotland, Ireland. Perennial. Summer.

Rootstock passing insensibly into the creeping base of the stem, and branching extensively. The stem is from 3 to 15 inches long, generally simple, but sometimes with a few branches. The leaves are mostly crowded, $\frac{1}{2}$ to 1 inch long. Bracts very small, deltoid, fringed like the sepals. Cyme few-flowered, frequently appearing lateral from the subsequent growth of an axillary branch resembling a continuation of the main stem; occasionally there are a few cyme-bearing branches produced below the terminal cyme, which give the inflorescence a paniculate appearance. Flowers pale buff-yellow, $\frac{1}{2}$ inch across. Stamens much shorter than the petals, with the filaments united beyond the middle, the bundles with small petaloid scales alternating with them. Leaves flaccid, yellowish-green. Plant more or less thickly clothed with shaggy hairs.

Marsh St. John's Wort.

French, *Millepertuis des Marais.* German, *Sumpf Harthen.*

EXCLUDED SPECIES.

HYPERICUM BARBATUM. *Jacq.*

E. B. ed. i. No. 1986.

Said to have been found by Mr. G. Don "by the side of a hedge near the wood of Aberdalgy, in Strathearn, in Perthshire." No one has found it since; and if it ever occurred there it was doubtless an escape from cultivation, as it is most unlikely that an Austrian plant, not occurring in Scandinavia, France, or North Germany, could be wild in Scotland.

ORDER XVII.—MALVACEÆ.

Herbs, shrubs, or soft-wooded trees, often clothed with stellate pubescence. Leaves alternate, generally palmately nerved, entire or more or less deeply divided in a palmate manner. Stipules free, often deciduous, sometimes very small or inconspicuous. Flowers regular, perfect, usually handsome purple, rose-colour, yellow, or white, solitary and axillary, often arranged in irregular racemes or panicles. Calyx persistent, of 5 (rarely 3 or 4) sepals more or less united, with the lobes valvate in æstivation; often with an epicalyx or involucre composed of 3 or more bracts resembling an outer whorl of sepals. Petals 5, hypogynous, usually adhering to the staminal column at the base, contorted, imbricated in æstivation. Stamens indefinite, hypogynous, and with the filaments more or less united at the base, so as to form a column surrounding the styles. Anthers 1-celled, with a more or less complete suppression of the septum. Torus small, or forming a conical point in the centre of the carpels, sometimes produced beyond the carpels and dilated at the apex. Ovary free, consisting of numerous carpels disposed round the torus, rarely reduced to 1. Style simple at the base, dividing into branches at the apex. Placentæ in the interior angle of the carpels, with one or more amphitropous or sub-anatropous ovules. Fruit generally dry, sometimes separating into cocca, sometimes forming a many-celled capsule, which dehisces loculicidally, more rarely indehiscent. Seeds uniform, sub-globose or ovoid, with the testa commonly crustaceous, and sometimes hairy or woolly, or rarely enclosed in a fleshy arillus. Albumen small in quantity or none. Embryo with the cotyledons generally broad, foliaceous, or more or less folded. Radicle near the hilum.

All the British species belong to the tribe Malveæ, which has the staminal column bearing anthers to the apex, the style with as many branches as there are cells or divisions in the ovary, the cotyledons foliaceous and folded; and to the sub-tribe eu-Malveæ, which has the carpels arranged in a single whorl, separating from the torus when mature as indehiscent cocca, and the ovules solitary, ascending.

GENUS I.—ALTHEA. *Linn.*

Epicalyx of 6 to 9 leaves, which are nearly equal and united together at the base. Calyx 5-cleft. Fruit depressed-orbicular; the carpels equalling or exceeding the axis or torus, separating when ripe as 1-seeded indehiscent cocca.

Tomentose or hairy herbs with the leaves palmately cleft or partite. Flowers purple or rose, solitary and axillary, or in fascicles in the axils of the leaves, frequently collected so as to form terminal racemes or corymbs.

The name of this genus of plants comes from the Greek word ἀλθεω (*althein*), to heal, in allusion to the virtues of some of the species.

SPECIES I.—ALTHEA HIRSUTA. *Linn.*

PLATE CCLXXVII.

Reich. Ic. Fl. Germ. et Helv. Vol. V. *Malv.* Tab. CCXXII. Fig. 4846.

Annual, with no rootstock. Lower leaves 5-lobed; upper ones 3-partite, with the lateral divisions deeply cleft; all with distant stellate hairs and long simple ones. Pedicels simple, solitary, longer than the leaves from which they spring when in fruit. Sepals glabrous, ciliated on the margins and the midrib with long simple hairs. Petals scarcely longer than the sepals. Carpels wrinkled on the margins, glabrous.

On the borders of fields. Very rare, and no doubt introduced. By the side of Cobham Park, directly North of Cuxton church.

[England]. Annual. Summer and Autumn.

Stems numerous, erect or ascending, slightly branched, 3 inches to 2 feet high. Lower leaves stalked, roundish-reniform, 1 to $1\frac{3}{4}$ inch across, with 5 shallow rounded crenate lobes; as they are placed higher on the stem, the separation between the lobes becomes deeper, the lobes themselves more acute, and instead of crenate they become crenate-serrate; higher still, the separation between the lobes extends till the lobes become 3-partite, with the lateral lobes 2-cleft; and the uppermost of all are tripartite, with linear entire lobes. Flowers pale purplish-pink, about 1 inch across, in a simple regular raceme. Epicalyx of 6 to 9 linear triangular segments, more than half as long as the sepals. Sepals lanceolate-acuminate, 3-nerved, with the lateral nerves only visible at the base, reticulated between the nerves, tuberculate upon the nerves and margins, with long hairs proceeding from the tubercles. Petals obovate, with the sides nearly straight, the apex truncate or slightly

notched. Styles much longer than the stamens. Torus with long hairs at the base. Carpels dark olive, rounded and slightly keeled on the back, with transverse radiating elevated ridges from the sides, quite glabrous. Fruiting calyx erect, with the epicalyx reflexed. Plant green, with long distant hairs.

Hispid Mallow.

French, *Guimauve Hérissée.* German, *Rauhhaariger Eibisch.*

SPECIES II.—**ALTHEA OFFICINALIS.** *Linn.*

PLATE CCLXXVIII.

Reich. Ic. Fl. Germ. et Helv. Vol. V. *Malv.* Tab. CLXXIII. Fig. 4849.

Perennial, with a fleshy rootstock. Leaves all slightly 5-lobed and doubly serrate, with a velvet-like pile or felt of stellate hairs. Peduncles branched or two or three together, shorter than the leaves from which they spring. Sepals clothed with a felt like that on the leaves. Petals more than twice as long as the sepals. Carpels nearly smooth, with a convex marginal ring, hispid.

In salt marshes, sides of ditches and meadows, by the sea and tidal rivers. Local, but occurring in most of the maritime counties in the South of England, and ranging as far North as Lincolnshire and South Wales. In Scotland it has only occurred by the shores of the Solway and in Arran, and even there it has most probably been introduced.

England, [Scotland]. Perennial. Late Summer and Autumn.

Rootstock very thick and fleshy, tapering gradually into the root. Stems erect, 2 to 4 feet high, round, simple or slightly branched. Lower leaves stalked, roundish, 1½ to 3 inches across; the upper ones becoming narrower and gradually passing into ovate; all plaited, slightly 5-lobed, the lobes having triangular teeth of unequal size. Peduncles axillary, 1 to 3-flowered, frequently 2 or 3 from the same axil, very short. Flowers pale flesh-colour, 1¼ to 2 inches across, arranged in irregular racemes or very contracted panicles towards the extremity of the stem. Epicalyx of 8 or 9 linear triangular leaves, shorter than the sepals. Sepals ovate, abruptly acuminate. Petals wedgeshaped-obovate, truncate and emarginate at the apex. Styles about equal to the stamens. Carpels brownish-olive, smooth and flat on the sides, surrounded by a convex hairy ring. Fruiting calyx connivent over the carpels. Plant pale greyish green, thickly covered with dense velvety stellate pubescence, with slightly longer hairs on the ribs of the leaves.

Marsh Mallow.

French, *Guimauve Officinale.* German, *Gebräuchlicher Eibisch.*

The whole of this plant, but especially the roots, abounds in a mucilaginous matter. It has long been used in medicine as a demulcent and emollient, and is still retained in the British Pharmacopœia. The root is the part of the plant most useful in medicine, as it contains a large quantity of gum. It should be gathered in the autumn from plants not less than two years old. It is extensively used in France, where it is known by the name of "guimauve." A favourite lozenge prepared from it is known in this country as *pâte de guimauve*, and is considered efficacious in coughs, hoarseness, etc. A decoction of the leaves is sometimes used for fomentations, and emollient cataplasms are prepared from the pounded root; an ointment made from the same part was formerly applied to burns and the bites of animals. It has a sweetish, pleasant taste. Cold water is rendered very ropy by it, but does not indicate the presence of starch by turning blue with tincture of iodine; boiling water, however, removes starch from it, and yields the blue appearance. Dr. Christison gives us the chemical composition of Althea root, which has of late been very carefully examined. It contains a little starch, nearly twenty per cent. of gum or mucilage, some uncrystallizable sugar, and a crystallizable principle, besides other unimportant constituents. The mucilage lies like the fecula in small cells in the form of minute grains, which may be obtained pure by washing the chopped root in rectified spirit, and allowing them to subside. A yellowish-white powder is thus procured, consisting of microscopic transparent grains, which seem intermediate between true gum and perfect starch. The crystalline principle, which was discovered in 1827 by M. Bacon, and termed by him "althæin," was afterwards found by Plisson to be identical with the asparagin of asparagus, or what is now considered the aspartate of ammonia. Marsh Mallow root is not only demulcent and soothing in itself, but it forms a most convenient vehicle for other remedies. It was known to the ancients, and is mentioned by Pliny, Virgil, and Dioscorides. The Marsh Mallow was then not only valued as a medicine, but was used to decorate the graves of deceased friends; and so indispensable was the plant deemed to the welfare of the living, that the poet exclaims,—

"Alas! when Mallows in the garden die."

The stems of the Marsh Mallow yield a good fibre, longer and stronger than that of the true Mallow, but not so fine. The leaves may be eaten when boiled; and we are told that they were formerly consumed in this way by the Romans.

GENUS II.—LAVATERA. *Linn.*

Epicalyx of 3 (or more rarely 4 to 6) leaves, which are nearly equal, and united at the base. Calyx 5-cleft. Fruit depressed-orbicular, the carpels not equalling the dilated apex of the torus, from which they separate when ripe as 1-seeded indehiscent cocca.

Sub-glabrous or pubescent herbs, indistinguishable in habit from the other British genera of Malvaceæ.

This genus of plants was named by Tournefort in honour of two Lavaters—neither of them the celebrated physiognomist, but physicians and naturalists, of Zurich.

SPECIES I.—LAVATERA ARBOREA. *Linn.*

PLATE CCLXXIX.

Reich. Ic. Fl. Germ. et Helv. Vol. VI. *Malv.* Tab. CLXXVIII. Fig. 4857.

Stem erect, very stout. Leaves 5- to 7-lobed, with short velvety pubescence. Peduncles several together, shorter than the leaves from which they spring. Epicalyx 3-lobed, longer than the sepals. Projecting point of the torus conical, ribbed.

On maritime rocks, especially such as are insulated. On the South and West coast, from Hants to the Isle of Man, and possibly native on Ailsa Craig at the mouth of the Firth of Clyde. Often cultivated; and as it becomes readily naturalized, it is to be found in various other places, as on the Bass Rock in Haddingtonshire, and on other islands in the Firth of Forth.

England, Scotland ?, Ireland. Biennial. Late Summer and Autumn.

Stem woody, 2 to 8 feet high, and in large examples often 1 inch in diameter. Leaves stalked, sometimes attaining a diameter of 8 or 9 inches, roundish, cordate at the base, the large ones 7- and the upper ones 5-lobed; lobes deltoid, crenate or crenate-dentate. Flowers 1½ inch across, pale purple with broad dark veins confluent at the base, arranged in racemes or raceme-like panicles at the extremity of the stem and branches. Epicalyx very large, with 3 broadly-ovate obtuse lobes united nearly to the middle. Sepals deltoid. Petals wedgeshaped-obovate, truncate and emarginate at the apex. Styles about equal to the stamens in length. Carpels pale olive, flat on the sides, with radiating wrinkles; the sides not rounded off, but forming a sharp angle with the back, which is reticulated with elevated lines, glabrous. Fruiting calyx closely connivent. Plant rather dull green, covered with a thin soft coat of stellate hairs.

The enormously large epicalyx with 3 ovate obtuse lobes sufficiently distinguishes this from the other British Malvaceæ, from all of which it also differs in its mode of growth, which resembles that of a miniature tree.

Tree Mallow.

French, *Lavatère en Arbre.*

GENUS III.—MALVA. *Linn.*

Epicalyx of 3 separate leaves. Calyx 5-cleft. Fruit depressed-orbicular. Carpels without a beak, separating from the torus when ripe into 1-seeded indehiscent cocca.

Sub-glabrous herbs, undistinguishable in habit from the other British genera of Malvaceæ.

The generic name is altered from μαλαχη (*malache*), soft, from the emollient nature of the species.

SPECIES I.—MALVA MOSCHATA. *Linn.*

PLATE CCLXXX.

Reich. Ic. Fl. Germ. et Helv. Vol. V. *Malv.* Tab. CLXIX. Fig. 4841.

Stem erect. Leaves (except the lowest) tripartite with the lateral segments again deeply cleft; segments not contiguous, deeply pinnatifid, with narrowly strap-shaped ultimate lobes. Fruit peduncles erect, longer than the sepals. Epicalyx of 3 strap-shaped leaves, half as long as the calyx. Calyx with 5 ovate-deltoid lobes, erect and enlarged when in fruit. Carpels with the sides gradually rounded into the back, nearly smooth, hispid on the back.

In hedgebanks and borders of fields. Generally but rather sparingly distributed in England and Scotland as far North as the Grampians.

England, Scotland, Ireland. Perennial. Summer and Autumn.

Rootstock producing several stems 1½ to 3 feet high. Stem round, frequently spotted with purple. Lower leaves reniform, 2 to 3 inches across, 3-cleft with contiguous segments crenated at the apex; upper leaves becoming more and more deeply divided, more shortly stalked, and having the middle segment becoming longer in proportion to the lateral ones as they are placed higher up on the stem. Stipules small, lanceolate. Flowers crowded towards the top of the stem or forming a short raceme with usually several peduncles from each node, in size 1½ to 2½ inches across, pink or more rarely white. Peduncles variable in length, erect when in fruit. Petals three or four times as long as the sepals, wedgeshaped-obovate, truncate and emarginate at the apex. Carpels dark olive, densely hispid on the back, which does not form an angle with the sides, but is rounded off into them. Plant exhaling a faint musky odour, pale green, sparingly clothed with long hairs, which are more abundant on the peduncles and sepals.

The deeply divided upper leaves distinguish this from all the other British Malvaceæ.

Musk Mallow.

French, *Mauve Musquée.* German, *Moschus Käsepappel.*

Were this pretty plant less common than it is, it would perhaps meet with more admirers; but the human mind, in its perverseness, is prone to prize what is least

attainable, and to hold an every-day object in slight estimation. The musk-like scent of this species distinguishes it from the rest, though it is but slight. The Musk Mallow, like the Anemone, closes its petals at night; in floral language, it is regarded as the emblem of a sweet, mild disposition; and we read that it was customary with the ancients to plant Musk Mallows around the graves of their departed friends.

SPECIES II.—MALVA SYLVESTRIS. *Linn.*

PLATE CCLXXXI.

Reich. Ic. Fl. Germ. et Helv. Vol. V. *Malv.* Tab. CLXVIII. Fig. 4810.
M. vulgaris, "*Tenore*, Syll. p. 336, *Gr.* & *Godr.* (non *Fries*)."

Stem ascending or decumbent. Leaves (except the lowest) with 5 or 7 shallow lobes (the middle one the longest); all the lobes triangular or rounded, irregularly crenate-serrate. Fruit peduncles spreading, longer than the calyx. Epicalyx of 3 oblong-lanceolate leaves, two-thirds the length of the sepals. Calyx with 5 ovate-deltoid lobes, connivent and not enlarged when in fruit. Petals twice or thrice as long as the calyx. Carpels glabrous, with the sides forming a sharp angle with the flat back, which is reticulated, the sides radiatingly wrinkled and surrounded by a margin separated from the disk by an elevated line.

In roadsides and waste places. Very common throughout England and the South of Scotland, but rare and confined to the sea coast in the northern part of the latter country, where it does not occur further North than Moray.

England, Scotland, Ireland. Perennial. Summer and Autumn.

Stems numerous, spreading, 2 to 3 feet long, pyramidally branched in luxuriant specimens. Root leaves 2 to 4 inches across, roundish, deeply cordate at the base, plaited, with very shallow rounded crenate lobes; stem leaves becoming smaller, having the lobes deeper and the central one more prominent, more distinctly serrate, and with shorter petioles as they are placed higher up on the stem. Flowers in elongated irregular racemes with numerous peduncles from each node, in size 1 to 1½ inches across. Petals often four times as long as the calyx, pale purple with 3 or 5 broad dark purple bands united at the base, more rarely white with pale purple bands, obovate-wedgeshaped, emarginate with 2 rounded lobes at the apex. Carpels brownish-olive, irregularly honeycombed on the back, which meets the sides in a continuous not denticulated line. Plant deep green, with the root leaves having often a purple blotch at the base. Plant sparingly hairy, with the hairs more numerous on the peduncles, margins of the leaves of the epicalyx, and on the sepals.

Common Mallow.

French, *Mauve Sauvage.* German, *Wilde Käsepappel.*

This common roadside plant possesses in a less degree the same properties as the Marsh Mallow, and has been employed as a decoction to relieve internal irritation. It is a favourite remedy with the country people, and is often applied externally in the shape of poultices, as well as being administered as a decoction. The foliage, when boiled, forms a wholesome vegetable: and we may all remember the avidity with which, as children, we have sought for the little hard fruit, tasting something like a nut, and commonly called a "cheese." "Chucky cheese" is the name given in Devonshire to the plant, in allusion to these little cheese-like fruits. All the Mallows yield an excellent fibre capable of use for cordage, paper, and textile fabrics. The fibre is not, however, durable or strong, and on this account has never been employed to any extent, though many efforts have been made to introduce it. In the East it has long been employed; and there is a tradition that Mahomet had a garment made of the Mallow fibre; and he was so well pleased with it, that he turned the plant into the more showy but less useful Geranium. In France a sort of paper, used chiefly for the decoration of rooms, has been manufactured from Mallow fibre.

SPECIES III.—MALVA ROTUNDIFOLIA. *Linn.*

PLATE CCLXXXII.

Malva vulgaris, *Fries. Reich.* Ic. Fl. Germ. et Helv. Vol. V. *Malv.* Tab. CLXVI. No. 4836.

M. vulgaris, *Fries*, Nov. Fl. Suec. p. 219.

Stems prostrate, except the central ones. Leaves all roundish-reniform, deeply cordate at the base, with 5 or 7 very shallow rounded crenate-serrate lobes, the middle one not evidently longer than the others even in the upper leaves. Fruit pedicels spreading-recurved, longer than the calyx. Epicalyx of 3 linear leaves, half or two-thirds as long as the calyx. Calyx with 5 broadly ovate-deltoid hairy lobes, slightly connivent, with reflexed tips, and not at all enlarged in fruit. Petals twice or thrice as long as the calyx. Carpels slightly downy, with the sides forming a blunt angle with the smooth rounded back; the sides smooth, having a distinct marginal band not separated from the disk by an elevated line.

In waste places and by roadsides. Common in England and the South of Scotland, and reaching about as far North as Malva sylvestris.

England, Scotland, Ireland. Perennial. Summer and Autumn.

Stems spreading, generally lying flat on the ground (except the central one, which is ascending) or ascending only at the extremities, 6 inches to 2 feet long. Leaves all on long stalks, $1\frac{1}{2}$ to $2\frac{1}{2}$ inches across, with the lobes very blunt and slightly developed in all; the size of the leaves is very little diminished towards the upper part of the stem. Flowers in irregular racemes, with several peduncles from each node, in size $\frac{3}{4}$ to 1 inch across. Petals whitish,

tinged with lilac towards the apex, with 3 or 5 lilac stripes united at the base, obovate-wedgeshaped, deeply emarginate, with 2 rounded lobes at the apex. Carpels olive-brown, not honeycombed on the back, which is not at all denticulated at the line where it meets the sides. Plant deep green, rather closely covered with short hairs, especially on the stems and calices, which, with the peduncles, are thickly clothed with stellate pubescence.

Dwarf Mallow.

French, *Petite Mauve Ronde.* German, *Uebersehene Käsepappel.*

SPECIES IV.—**MALVA BOREALIS.** *Wallmann.*

PLATE CCLXXXIII.

Malva rotundifolia, *Fries.* *Reich.* Ic. Fl. Germ. et Helv. Vol. V. *Malv.* Tab. CLXVI. Fig. 4835.

M. rotundifolia, *Linn.* *Fries,* Nov. Fl. Suec. p. 218.

M. pusilla, *Sm.* Eng. Bot. No. 241.

M. parviflora, *Huds.* Fl. Angl. p. 307 (non *Linn.*).

Stems decumbent. Leaves all roundish, deeply cordate at the base, with 5 or 7 shallow roundish-reniform crenate-serrate lobes, the middle one not longer than the others even in the upper leaves. Fruit pedicels spreading-recurved, longer than the calyx. Epicalyx of 3 linear-lanceolate leaves, as long the calyx. Calyx with 5 ovate-deltoid acuminated glabrous lobes, ciliated at the margins, slightly connivent, with reflexed tips, and not at all enlarged in fruit. Petals scarcely exceeding the calyx. Carpels slightly downy, with the sides forming a sharp angle with the flat back, which is reticulated; the sides radiatingly wrinkled and not margined, but surrounded by an elevated slightly denticulated border, caused by the back being broader than the rest of the carpel.

In waste places. Said to have been found at Hythe, in Kent, in Hudson's time, and the figure in "English Botany" was drawn from a plant raised from the seed of a specimen communicated by Hudson to Pelham. The evidence for its occurrence is by no means satisfactory; but as it is common in Scandinavia and North Germany, it is very likely to occur in Britain; while, on the other hand, from its great similarity to M. rotundifolia, it is extremely liable to be overlooked.

England? Annual. Summer and Autumn.

Extremely like M. rotundifolia, but more slender and always annual, with the leaves rather less deeply lobed, the petals much shorter, and the sculpturing of the carpels quite different.

Linnæus appears to have confounded this plant with the preceding; but the name "rotundifolia" has been so generally applied to the latter that mistakes are not likely to arise.

Small-flowered Mallow.

German, *Rundblättrige Käsepappel.*

SPECIES V.—MALVA VERTICELLATA. *Linn.*

PLATE CCLXXXIV.

Stem erect. Leaves all roundish-reniform, deeply cordate at the base, with 5 deltoid rounded crenate-serrate lobes, the middle one slightly longer than the others. Fruit pedicels erect, mostly shorter than the calyx. Epicalyx of 3 lanceolate lobes, three-quarters as long as the calyx. Calyx with 5 deltoid-acuminate hairy ciliated lobes, erect and enlarged in fruit. Petals twice as long as the calyx. Carpels glabrous, with the sides gradually rounded into the back, which is also rounded and not reticulated; the sides with prominent elevated ridges, not margined or bordered.

In cornfields at Llanelly, in Carmarthenshire, in 1843 and succeeding years; but not indigenous, as its native country is China, and it does not occur at all wild in Europe.

[England]. Annual. Summer and Autumn.

Stem solitary, slender, 8 to 18 inches high in the British specimens which I have seen, with the leaves on rather long stalks, intermediate in form between those of M. rotundifolia and sylvestris, 2 to 3 inches across. Flowers $\frac{1}{2}$ inch across, in clusters few together, some of them sessile, but usually one at least of each cluster distinctly stalked. Petals white, shading into lilac towards the apex. Carpels more strongly wrinkled on the sides than in any of the other British species, but without the honeycombed back which generally accompanies this mode of sculpturing; the radiating lines being in fact continued without break, and disappearing gradually in the middle of the back. Whole plant dull green, slightly hairy, with the upper part of the peduncles and the pedicels covered with stellate pubescence.

Erect Mallow.

ORDER XVIII.—TILIACEÆ.

Trees, shrubs, or rarely herbs. Leaves alternate (rarely opposite), varying in the arrangement of the nerves and amount of division. Stipules usually small and deciduous (more rarely large and persistent) or absent. Flowers regular, generally perfect, axillary or terminal, usually cymose. Cymes sometimes solitary, or disposed in panicles. Sepals 5 (rarely 3 or 4), free or coherent, usually valvate in æstivation. Petals generally as many as the sepals, sometimes absent. Stamens numerous, sometimes separated from the petals by the enlargement of the torus on which they are placed, free (or more rarely with the filaments united), and mono- or poly-adelphous. Anthers 2-celled. Torus small or enlarged. Ovary free, sessile upon the torus, 2- to 10-celled. Style entire, or more or less deeply divided into as many cells as there are lobes in the ovary; sometimes absent, so that the stigmas are sessile. Placentæ in the interior angle of the carpels, 1, 2, or numerous, anatropous or sub-anatropous. Fruit dry, drupaceous or berry-like, and indehiscent; or dividing into cocca, or splitting into as many valves as there are carpels, in which case the dehiscence is commonly loculicidal. Seeds without an arillus, with the testa generally hard or leathery, sometimes pilose. Albumen fleshy (rarely absent). Embryo commonly straight. Cotyledons often broad and foliaceous; the radicle near the hilum.

All the British species belong to the tribe Tilieæ, which has the sepals distinct, the petals coloured, not foveolated, with imbricated and often contorted æstivation, and the torus small, so that the stamens are inserted close to the petals.

GENUS I.—TILIA. *Linn.*

Sepals 5, free, coloured, deciduous. Petals 5, in some of the species with petaloid scales on the inner side. Stamens indefinite, irregularly polyadelphous, all antheriferous. Ovary 5-celled, with 2 ovules in each cell. Style simple, with the stigma 5-lobed. Fruit commonly crustaceous, sub-globular or ovoid, with 3 to 5 more or less distinct ribs, 1-celled by the disappearance of the partitions, and 1- or 2-seeded by abortion of the other ovules.

Trees with tough fibrous inner bark, and leaves alternate, horizontally distichous, stalked, roundish, unequally cordate at the base, abruptly acuminate or cuspidate at the apex, serrate, glabrous or pubescent, with tufts of pale or fawn-coloured hairs in the forks of the veins on the under side. Flowers white or yellowish, in axillary or terminal cymes, the peduncle of which is adnate for some distance to the large sub-foliaceous bract. Fruit usually downy at first, but often glabrous when ripe.

The derivation of the name of this genus is somewhat obscure, and we find authors who state it to be unknown; but others say it is derived from the Greek word πτιλον (*ptilon*), a feather, alluding to the feathery appearance of the bracts and flowers: others derive it from the Greek word τιλια (*tilai*), light bodies floating in the air, like wool or feathers.

SPECIES I.—TILIA GRANDIFOLIA. *Ehrh.*

PLATE CCLXXXV.

T. platyphyllos, *Scop.* *Reich.* Ic. Fl. Germ. et Helv. Vol. VI. *Til.* Tab. CCCXVII. CCCXVIII. Fig. 5139.

T. platyphylla, *Gr. & Godr.* Fl. de Fr. Vol. I. p. 283.

Young branches and buds downy. Leaves thin, coarsely serrate, downy beneath, especially on the veins. Cymes umbellate, few-flowered. Nectariferous scales none. Fruit woody, pubescent, roundish-obovate, shortly acuminated at the apex, with 3 to 5 very prominent ribs when the fruit is mature.

In woods and hedges. Probably not native, although many botanists consider it to be so, especially about the rivers Wye and Severn.

England? [Scotland, Ireland]. Tree. Summer.

A large tree 20 to 50 feet high, with spreading branches and rather smooth dark-olive bark; young twigs bright olive-brown or sometimes tinged with red. Leaves 2½ to 4 inches across, very unequal at the base, roundish, abruptly acuminate (almost cuspidate) at the apex, longer than the footstalk. Cymes axillary, developed from the shoots of the year, commonly 3-flowered. Bracts oblong, adnate to the peduncle for half the length of the latter, but not quite for half the length of the bract, which is pinnately veined, strongly reticulated, and greenish-yellow. Stipules concave, yellowish, deciduous. Flowers ⅝ inch across, yellowish-white. Sepals downy within, nearly glabrous on the outside, elliptical-lanceolate. Petals oblanceolate, a little longer than the sepals. Stamens longer than the petals. Ovary globose, densely downy. Style about as long as the stamens. Fruit when mature ⅝ to ½ inch long, very hard, covered with a felt of down, and having a flat

polygonal base, from which the strongly-marked ribs take their rise. Ribs 3 to 5, very often 4. Leaves bright green, a little paler beneath, flaccid.

It is extremely doubtful whether T. corallina (Sm.) be identical with the present species or not. Dr. Lindley refers it to T. rubra (D. C.), which has the fruit without elevated lines, and therefore no doubt belongs to T. intermedia. Smith himself was unable to meet with either the flowers or fruit of T. corallina; but there can be little doubt that, whatever it was, it had been planted in Stokenchurch woods, Oxford, where it is no longer to be found. There are a good many other synonyms usually given for the present species; but not having seen authenticated specimens, I do not venture to quote them, as T. grandifolia and T. intermedia have been so much confused together that it seems nearly impossible to unravel the knot of mystery that surrounds them. The fruit is indeed the only infallible mode of separating the two, as the other characters which have been depended upon for the purpose are by no means constant.

Large-leaved Lime.

French, *Tilleul à Grandes Feuilles.* German, *Breitblättrige Linde.*

This is the wild Lime tree of Switzerland and the South of Europe, but is often found in old plantations in England. There are some very large trees at Penshurst and at Waltham Abbey, the plantation of which is of very ancient date. Some famous old trees of this species in the churchyard of Seidlitz, in Bohemia, are reported to have miraculously borne hooded leaves ever since the monks of the neighbouring convent were all hanged upon them.

SPECIES II.—TILIA INTERMEDIA. *D. C.*

PLATE CCLXXXVI.

Reich. Ic. Fl. Germ. et Helv. Vol. VI. *Til.* Tab. CCCXIII. CCCXIV. Fig. 5138.
T. europæa, "*Linn.*" *Bab.* Man. Brit. Bot. ed. v. p. 59. *Hook. & Arn.* Brit. Fl. ed. viii. p. 78. *Sm.* Eng. Bot. No. 610.
T. vulgaris, "*Hayn.*" *Fries,* Mant. III. p. 199.
T. parvifolia, β intermedia, *Koch,* Syn. Fl. Germ. et Helv. ed. ii. p. 145.

Young branches and buds generally quite glabrous. Leaves thin, rather finely serrate, almost always glabrous beneath. Cymes corymbose, rather few-flowered. Nectariferous scales none. Fruit woody, pubescent, sub-globular, apiculate at the apex, without distinct ribs when the fruit is mature.

In woods and hedges, but with scarcely a better claim to be considered native than T. grandifolia.

England? [Scotland, Ireland]. Tree. Summer.

Very similar to T. grandifolia, but with the leaves usually

smaller and commonly glabrous, except the tufts in the forks of the veins on the under side of the leaves. The flowers are generally more numerous (from 4 to 8), and the cyme is often branched in a corymbose manner. The only invariable distinction is in the fruit, which is rounder and destitute of the polygonal base and the prominent ribs which are so conspicuous in T. grandifolia.

Common Lime.

French, *Tilleul Officinal.* German, *Rüsterblättrige Linde.*

The Lime or Linden tree is not generally recognized as indigenous; but it is found in woods throughout our island, and there is great reason to suppose that it has long been an inhabitant of Great Britain. Few of us but are well acquainted with its elegant form and beautiful bright green foliage in the early summer, when it is seen to most advantage, especially in dry seasons, during which it is liable to the attacks of aphides, which cover its leaves with a viscous substance known by the name of honey-dew, and exist in colonies on the branches, looking like dark sooty masses. Since the early fashion of gardening and planting in formal rows has disappeared, the Lime is not so generally introduced into plantations as it used to be; still, we must all be able to recall the sweet scent of the Lime flowers as an early recollection, and it is now constantly seen in avenues and park plantations. It has, too, the merit of enduring the smoke of towns better than most trees, and, with the exception of the plane-tree, there is perhaps none that does better under these disadvantageous conditions. On the Continent it is often planted along the highways and the streets of towns, especially in Germany and Holland, where it sometimes attains an enormous size. The Dutch plant the Lime along their widest streets and by the side of their canals, and the whole country is perfumed by the flowers during the months of July and August. The praises of the Lime tree have been sung by ancient and modern poets, and descriptions of it are given in glowing language by many well-known writers. Fénelon, in his "Telemachus," decorates with "flowery Lime trees" his enchanted Isle of Calypso. Theophrastus and Pliny make mention of it; and Gerarde says: "The Lime or Linden tree waxeth very greate and thicke, spreading foorth his branches wide and far abroad, being a tree which yieldeth a most pleasant shadow, under and within whose boughes may be made brave sommer houses and banketting arbors." Evelyn describes this favourite tree in the most animated manner. "Is there," says he, "a more ravishing or delightful object than to behold some entire streets and whole towns planted with these trees in even lines before their doors, so as they even seem like cities in a wood?"

> "The stately Lime, smooth, gentle, straight, and fair,
> With which no other Dryad can compare,
> With verdant locks and fragrant blossoms deckt,
> Does a large, even, odorate shade project."

Of celebrated and remarkable Lime trees we have many mentioned. Perhaps the most noticeable was that which grew on the native farm of the great naturalist Linnæus, and from which it is said that his ancestors derived their family name Linn, being Swedish for a Lime tree. The great Lime at Neustadt, in Evelyn's time, had a trunk measuring twenty-seven feet in circumference, and the town is still called Neustadt-an-der-Linden. At Moorpark, in Hertfordshire, there is a celebrated Lime tree seventeen feet round and one hundred feet high. The celebrated Lime of Cleves was also of great magnificence. In the middle of the tree was cut a room of considerable dimensions, while the external parts were most curiously trimmed and tortured in the highest

style of Dutch taste. The Lime trees with which we are all familiar in St. James's Park were planted at Evelyn's suggestion about A.D. 1660, with a view to the improvement of the air, and to avert the evils pointed out in his "Fumifugium." He says: "It is a shameful negligence that we are no better provided with nurseries for a tree so choice and so universally acceptable. We send commonly for this tree into Flanders and Holland, while our woods do in some places spontaneously produce them." The old Linden tree of Soleure, in Switzerland, said he, is "right noble and wondrous to behold. A bower composed of its branches is capable of holding three hundred persons sitting at ease; it has also a fountain set about with many tables, formed solely of the boughs, to which men ascend by steps; and all is kept so accurately and thick that the sun never looks into it." But it is not only as an ornamental and beautiful tree that the Linden deserves and has attracted notice. Its timber, too soft for building and most outdoor work, is valuable to the carver and turner. It is of a pale yellow or white colour, close-grained, soft, light, smooth, and not attacked by insects. It is used by pianoforte makers for sounding-boards, and by cabinet-makers for a variety of purposes. It is especially adapted for carving. Many of the fine carvings at Windsor Castle, Trinity College Library at Cambridge, and in the Duke of Devonshire's mansion at Chatsworth, are of this material. It is supposed by some that blocks of it were used by Holbein for his wood engravings; since his time, however, the Box-tree has been preferred for this purpose. The Lime tree wood makes excellent charcoal for gunpowder; even better than alder, and nearly as good as hazel. Of late years a method of making paper from the young stems has been invented, and may possibly prove useful. A work of Cicero, said to be written on the inner bark of the Lime tree, is still preserved at Vienna. One of the most important uses of the Lime tree in the North of Europe is that of supplying materials for forming ropes and mats, the latter of which enter largely into commerce. The inner bark of the tree is called "bast," and forms the well-known substance which is woven into garden-mats, called bass or bast mats. The Russian peasantry make shoes from the bark of this tree, and ropes are still made from it in Cornwall and some parts of Devonshire. The mats which we see in our gardens so frequently covering our trees and protecting them either from the winter frosts or the depredations of birds, are made chiefly in Russia and Sweden. For this purpose small trees are preferred; they are steeped in water till the bark readily separates into layers, when it is split into ribbons and dried. In Sweden fishing-nets are made of it, and in Carniola a coarse sort of cloth is woven from it by the shepherds, who wear it as their ordinary dress. The foliage of the Lime is much relished by cattle, either green or made into hay; and in Norway and Sweden it is largely used as fodder, but it is said to give an unpleasant flavour to the milk of cows fed upon it. The sap of the Lime tree drawn off in the spring and evaporated affords a considerable quantity of sugar; and Adanson suggested the idea of employing it for this purpose in France in the same way as the sap of the birch and the maple. The honey produced by the sweet-smelling flowers is thought superior to all others for its flavour and its delicacy. The author of the "Georgics," when speaking of the industrious old Corycian swain, "lord of few acres and those barren too," yet connects his most valuable possession, his bees, with their favourite Limes:—

> "He, therefore, first among the swains was found
> To reap the product of his laboured ground,
> And squeeze the combs with golden liquor crown'd;
> His Limes were first in flower, his lofty pines
> With friendly shade secured his tender vines."

Travellers relate that the famous Kowno honey is made exclusively from the blossoms of this tree. Pallas tells us that the "lissez," or genuine Linden honey, which is of a greenish colour and delicious taste, flows from the same source, and is taken from the hive immediately after the Lime tree has been in blossom. In Lithuania, where immense forests of the Lime grow, the honey collected from the flowers is very valuable. The peasants make holes in the large trees, which the bees soon convert into hives, and the combs are removed when full. This honey fetches a large price in the markets, for it is thought to be a valuable remedy in lung diseases. Tea made from the blossoms of the Lime tree is soft, well-flavoured, and sweet, in taste resembling liquorice, and is much used in France as a hypnotic in cases of sleeplessness. During the last century Missa, a French chemist, found that the fruit of the Lime ground up with some of the flowers in a mortar furnished a substance resembling chocolate in flavour. Some attempts were made in Prussia to introduce the manufacture of this Lime chocolate, but it was abandoned on account of the liability of the paste to decompose; were some means found to remedy this defect, it might still become a pleasant and nutritious article of diet. The Lime is not used in medicine at the present day, but the old physicians thought highly of it as an antispasmodic. The real value and uses of the tree are so numerous, that in the days of Pliny it was called "the tree of a thousand uses;" and this perhaps is the reason why we find fewer imaginary virtues ascribed to it than to many less really valuable.

SPECIES III.—TILIA PARVIFOLIA. *Ehrh.*

PLATE CCLXXXVII.

Reich. Ic. Fl. Germ. et Helv. Vol. VI. *Til.* Tab. CCCXI. CCCXII. Fig. 5137.
T. parvifiora, var. α, polyantha, *Koch*, Syn. Fl. Germ. et Helv. ed. ii. p. 145.
T. sylvestris, *Desf.* *Gr.* & *Godr.* Fl. de Fr. Vol. I. p. 286.
T. microphylla, *Willd.* Enum. Hort. Berol. Vol. I. p. 565.

Young branches and buds glabrous. Leaves rather thick, finely serrate, glabrous beneath. Cymes corymbose, rather many-flowered. Nectariferous scales none. Fruit like parchment in consistence but brittle, pubescent, "at length nearly glabrous" (Brit. Fl.), obovate, "slightly oblique" (Bab. Man.), acuminate with very indistinct elevated ribs.

In woods. Probably truly native in many of the old woods in England; also marked as a native in Dr. Moore's list of Irish plants.

England, [Scotland], Ireland. Tree. Summer.

In this species the leaves are considerably smaller than in the two preceding, being from 1½ to 2½ inches across; in texture they are firmer, and glaucous and glabrous beneath, except the usual tufts of hairs in the forks of the veins; the petioles are longer in proportion. The flowers are more numerous, with shorter pedicels, although the peduncle of the cyme is longer in proportion. The fruit is about ¼ inch long, much less woody, and the

ribs are very faintly marked, though perhaps rather more so than in T. intermedia.

I have only seen dried specimens of the fruit, and in these could not perceive the onesided appearance described by Professor Babington, nor the ultimate loss of pubescence mentioned in the "British Flora;" but the distortion consequent upon drying, and the possibility of the fruit not being mature, is sufficient to account for these discrepancies in appearance, though it may be that the plant is variable in these respects. Mr. Bentham unites the three species given above under the name of T. europæa.

Small-leaved Lime.

French, *Tilleul à Petites Feuilles.* German, *Rüsterblättrige Linde.*

This species being planted along with the others in avenues or parks will ensure a longer succession of flowers than either of them alone.

Sub-Class II.—POLYPETALÆ DISCIFLORÆ.

Calyx commonly free from the ovary, or more rarely with its tube adherent to the base of the ovary. Sepals sometimes distinct, but very frequently more or less united. Torus generally expanded into a fleshy disk, sometimes divided into glands, free or uniting the ovary and calyx together, occasionally adhering to the ovary alone, or more rarely distinct from the ovary and covering the base of the calyx. Petals generally equal in number to the sepals, inserted into the torus or into the base of the calyx round the disk. Stamens equal in number to the petals (or twice as many), inserted round, within, or on the top of the disk. Ovary superior, commonly syncarpous, free or immersed in the disk.

ORDER XIX.—LINACEÆ.

Herbs, undershrubs, shrubs, or rarely trees, glabrous or hairy. Leaves alternate (rarely opposite), simple, entire or crenate-serrate. Stipules lateral or interpetiolar, sometimes persistent, sometimes small and deciduous, sometimes entirely absent. Flowers regular, perfect, generally handsome, blue, white, or yellow (more rarely red), in irregular terminal pseudo-racemes often combined into corymbs, or in dichotomous cymes. Sepals 5 (rarely 4), free or united at the base, imbricated. Petals as many as the sepals, hypogynous or slightly perigynous, imbricated, often contorted. Stamens usually twice as many (more rarely thrice as many) as the petals, the alternate ones sometimes abortive; the filaments united at the base into a ring or short tube; anthers versatile, 2-celled, with a slender connective. Glands 5, entire or cleft, adnate to the outer side of the tube of the stamens, sometimes inconspicuous. Disk absent, unless represented by the tube of stamens. Ovary free, undivided, 3- to 5-celled. Placenta in the upper part of the inner angle of the carpels. Ovules 2 or 1 to each cell, anatropous. Styles 5 to 3, free or more or less united. Fruit generally a capsule, splitting septicidally into dehiscent cocca,

but sometimes membranaceous and indehiscent, or drupaceous with as many stones as there are carpels, or by abortion only one. Seeds 2 or 1 in each coccum or stone, generally obovate, compressed, with a tough membranous testa. Albumen fleshy, rarely none. Embryo generally straight, with the cotyledons commonly oval or elliptical, and the radicle superior.

The British species all belong to the tribe Eulineæ, which are herbs or undershrubs with contorted fugaceous petals, perfect stamens as many as the petals, capsule dehiscing septicidally, or rarely 1-seeded and sub-indehiscent.

GENUS I.—RADIOLA. *Gmel.*

Sepals 4, 3-toothed, persistent. Petals 4, minute, caducous. Stamens 4, with very minute teeth between them. Filaments nearly free. Styles 4. Capsule splitting into 4 valves; each valve imperfectly 2-celled and 2-seeded, and splitting down the middle.

This genus consists of an extremely minute annual plant with opposite leaves and dichotomously or trichotomously branched stems terminating in corymbose cymes of very numerous small sub-globular flowers.

This genus was named by Dillenius from *radiolus*, a ray, because the cells of the ripe capsule diverge like the rays of a little wheel.

SPECIES I.—RADIOLA MILLEGRANA. *Sm.*

PLATE CCLXXXVIII.

Reich. Ic. Fl. Germ. et Helv. Vol. VI. *Hyp.* Tab. CCCXXV. Fig. 5152.
Radiola linoides, *Gmel.* *Koch*, Syn. Fl. Germ. et Helv. ed. ii. p. 141. *Gr.* & *Godr.* Fl. de Fr. Vol. I. p. 284.
Linum Radiola, *Linn.* Sp. Pl. p. 402.

The only known species.

On damp heaths and commons, especially on sandy and gravelly soils. Rather local, but generally distributed throughout the kingdom.

England, Scotland, Ireland. Annual. Late Summer and Autumn.

A much branched slender plant, 1 to 2 inches high. Stems erect, thread-like, dichotomously branched throughout, frequently with opposite branches below the forks. Leaves entire, about $\frac{1}{8}$ inch long, ovate, acute, sessile, slightly succulent, 3- to 5-nerved when dry. Flowers very numerous, placed in the forks of the

stem, scarcely so large as a pin's head, white. Sepals 4, united to their middle, each one 3-cleft (more rarely 2- or 4-cleft), with pointed segments. Petals oval, about as long as the sepals. Fruit pedicels twice as long as the calyx. Capsule globular-depressed, enclosed in the connivent calyx, with 8 shallow lobes. Plant dull green, slightly glaucous, often tinged with purple, quite glabrous. The larger tufts of this plant are corymbose or semicircular; it is only in very small examples that the whole plant seems reduced to a simple dichotomous cyme.

Flax Seed.

French, *Radiole Faux-Lin.* German, *Tausendkörniger Zwerg-Lein.*

GENUS II.—LINUM. *Linn.*

Sepals 5, free, entire, persistent. Petals 5, fugaceous. Stamens 5, hypogynous, slightly cohering at the base, alternate with the petals, with as many rudimentary ones (or staminodes) alternating with the antheriferous ones. Glands 5, very small, adnate to the tube of the stamens. Ovules 2 to each cell. Styles 5 (rarely 3), generally free. Capsule septicidally 5-valved, with each valve more or less imperfectly divided into two by a spurious dissepiment, and having 2 seeds, or splitting into 10 1-seeded cocca; rarely by abortion 3-celled.

Herbs or undershrubs, mostly glabrous, without evident stipules. Leaves narrow, entire, alternate, or rarely opposite. Flowers in pseudo-racemes or cymes, often arranged in a corymbose or paniculate manner, generally handsome and brightly coloured.

Many of the species have the flowers dimorphous, in respect to the length of the stamens or styles; and according to the observation of Mr. Darwin, the long and the short-styled plants do not usually produce fertile seeds when apart.

The name of this genus of plants comes originally from a Celtic word *llin*, a thread; hence the Greek word Λινον (*linon*), and the Latin *linum*; all of which allude to its peculiar appropriation in the arts, and from which the English word *linen* is derived.

Section I.—CATHARTOLINUM. *Grisb.*

Petals not adhering by their claws. Leaves opposite, without glands (abortive stipules) at the base.

SPECIES I.—LINUM CATHARTICUM. *Linn.*

PLATE CCLXXXIX.

Cathartolinum pratense, *Reich.* Ic. Fl. Germ. et Helv. Vol. VI. *Hyp.* Tab. CCCXXV. Fig. 5153.

Root annual, producing 1 or more erect stems, slightly branched at the apex. Leaves opposite or only the upper ones alternate, elliptical-strapshaped. Flowers numerous, drooping before expansion, in terminal dichotomous cymes.

In pastures and on banks. Common and generally distributed.

England, Scotland, Ireland. Annual. Summer and Autumn.

Stems slender, wiry, erect from a curved base, 3 inches to 1 foot high, in large specimens often numerous, with a few ascending-spreading branches at the apex. Leaves $\frac{1}{4}$ to $\frac{3}{4}$ inch long, the lowest elliptical, becoming narrower as the pairs are placed higher on the stem; uppermost leaves alternate. Bracts opposite, similar to the leaves, but smaller. Flowers $\frac{1}{4}$ inch across, white, with a yellow eye. Sepals lanceolate-acute, slightly denticulate. Petals scarcely twice as long as the sepals, obovate, rounded or obtuse at the apex. Fruit pedicels elongated. Capsule globular, slightly depressed, mucronate, scarcely longer than the sepals, which are connivent over it, splitting into 10 valves. Seeds minute, ovoid, plano-convex, fawn-coloured, very finely granulated, and slightly shining. Plant glabrous, glaucous green, with the lower leaves and stems often tinged with purple.

The opposite leaves and small white flowers distinguish it from all the other species of the genus.

Purging Flax.

French, *Lin Purgatif.* German, *Purgir Lein.*

The whole of this herb is cathartic, and was formerly extensively employed in medicine; but it is now little used. It has an intensely bitter taste, and is without odour. Its action is very uncertain, and it is not therefore often given by regular practitioners of medicine. In some parts of the country it is boiled in ale, and the decoction given for rheumatism. The usual dose is one drachm of the dried plant, or a handful of the fresh herb infused in water or whey. In Gerarde's time it was known under the name of "Mill Mountain," and he relates how he came to be acquainted with the plant in company with Doctor Lake, who was afterwards made Bishop of Bath and Wells, and "who always used this herbe for his purge after the said manner, as his man affirmed, putting a handful of Mil Mountain into a small tunne or pipkin of a pinte filled with white wine, and setting it on the embers to infuse all night, then drinking the wine in the morning fasting."

Section II.—EU-LINUM.

Petals not adhering by their claws. Leaves alternate, scattered, without glands (abortive stipules) at their base.

SPECIES II.—**LINUM PERENNE.** *Linn.*

PLATE CCXC.

Linum anglicum, "*Mill.*" *Planch.*

L. perenne, var. anglicum, *Planch.* in Hook. Lond. Jour. of Bot. Ser. II. Vol. VII.

Rootstock woody. Stems very numerous, sub-erect from a decumbent base, simple except at the apex. Leaves strap-shaped, attenuated at each end and acute at the apex, crowded, ascending. Flowers few, in terminal pseudo-racemes, usually combined into irregular corymbs. Two outer sepals obovate, apiculate with narrow membranous margins; three inner ones roundish-obovate, sub-truncate, rounded at the apex, scarcely apiculate, with broad membranous margins; all entire, 5-nerved (rarely only 3-nerved), with only the middle nerve reaching the apex. Petals broadly obovate, four to six times as long as the sepals. Capsule apiculate.

In rough chalky places. Rare. The only specimens I have seen are from Cambridgeshire, though it has been reported from several other counties. Essex, Suffolk, Norfolk, Northamptonshire, Salop, Rutlandshire or South Lincolnshire, Yorkshire, and Durham, are those in which it has most likely been found; but the species has been so confounded with L. angustifolium, that little reliance can be placed on book-statements of localities.

England. Perennial. Summer.

Stems growing in dense tufts, 1 to 2 feet high, wiry and almost woody and leafless at the base, densely leafy in the middle portion, with the leaves ascending or sub-erect, $\frac{1}{2}$ to $\frac{3}{4}$ inch long. Flowers rather few, bright cobalt blue, 1 to $1\frac{1}{4}$ inch across, with the petals overlapping each other at the edges. Inner sepals very blunt, sometimes with, but frequently without, an apiculus. Petals broadly obovate-wedgeshaped, truncate at the apex, contiguous. Fruit pedicels erect, one to three times as long as the calyx. Capsule globular, scarcely apiculate. Seeds greyish-olive coloured, surrounded by a very narrow wing. Plant deep green, very slightly glaucous, quite glabrous.

This is one of the species in which the flowers are dimorphous;

in some individuals the stamens are longer than the styles, while in others they are shorter.

I have not ventured to quote Reichenbach's figure of L. perenne (l. c. Tab. CCCXXXVI. Fig. 5159), because he has there represented the sepals (even the inner ones) acuminated at the apex. His figure of L. alpinum (Tab. CCCXXXV. Fig. 5160) has these organs much more like those of our L. perenne. It is most probable that L. alpinum (Jacq.), L. Leonii (F. Schultz), L. austriacum (Linn.), etc. are only sub-species of L. perenne; indeed, M. Planchon considers them as mere varieties. This is probably the case with L. alpinum; but L. austriacum, with its reflexed fruit pedicels, appears to be more than a variety. Should it prove that this is the case, and that it is a sub-species, the British plant should bear Miller's name of Linum anglicum.

Perennial Flax.

French, *Lin Vivace.* German, *Ausdauernder Lein.*

Some years ago this species of Flax was recommended for cultivation as a fibre plant; but it has been little adopted, the fibre being coarser and the seeds smaller than those of the common Flax. As the plant will last several years, and yields an abundant crop of stems, it has been thought that it might be used for making paper. The seeds contain the same sort of oil as those of the ordinary species.

SPECIES III.—**LINUM ANGUSTIFOLIUM.** *Huds.*

PLATE CCXCI.

Reich. Ic. Fl. Germ. et Helv. Vol. VI. *Hyp.* Tab. CCCXXIX. Fig. 5158 (5154).

Rootstock very short, scarcely woody, or none. Stems rather few, more rarely solitary, sub-erect, slightly branched, with the branches divaricate. Leaves strap-shaped or linear, attenuated at each end, acute at the apex, not crowded, spreading-ascending. Flowers few, in terminal pseudo-racemes usually combined into corymbose panicles. Two outer sepals elliptical-acuminate, with narrow entire membranous margins; three inner ones oval, cuspidate, with broad membranous fimbriate-ciliate margins; all indistinctly 3-nerved, with only the middle nerve reaching the apex. Capsule mucronate, with the edges of the dissepiments in the interior downy.

On dry banks and borders of fields. Not uncommon in the South and West of England; extending northward as far as Lancashire and the Isle of Man on the West, and to Norfolk on the East side of the island.

England, Ireland. Annual or Perennial. Summer and Autumn.

This species has frequently been mistaken for L. perenne, but the stems are fewer in L. angustifolium, and spring directly from one point at the crown of the root; they are rather more wiry, and have the leaves more remote. The branches in the upper part of the stem are longer, more wiry and numerous. The flowers are much smaller than those of L. perenne, $\frac{1}{2}$ to $\frac{3}{4}$ inch across, very pale bluish-lilac, with the petals narrower, less truncate at the apex, scarcely contiguous, more caducous, and not more than twice or thrice as long as the sepals. The capsules are on longer pedicels and much more strongly mucronate, but the very different structure of the sepals is by far the most satisfactory character for separating the two. The seeds are $\frac{1}{8}$ inch long, plano-convex, dark brown, shining. Whole plant dull glaucous green, with the stems frequently tinged with purple.

It is certainly frequently only of annual duration on the dry chalky banks of the Kentish coast.

Narrow-leaved Flax.

French, *Lin à Feuilles Étroites.* German, *Dünnblättriger Lein.*

SPECIES IV.—LINUM USITATISSIMUM. *Linn.*

PLATE CCXCII.

Reich. Ic. Fl. Germ. et Helv. Vol. VI. *Hyp.* Tab. CCCXXIX. Fig. 5155.

Root annual. Stems solitary or few, corymbosely branched; branches ascending towards the apex. Leaves elliptical-strap-shaped, attenuated at each end, acute at the apex. Two outer sepals oval-acuminate, with rather narrow entire membranous margins; three inner ones broader, acuminate with broad fimbriate-ciliate membranous margins; all strongly 3-nerved, with only the middle nerve reaching the apex. Capsule mucronate, with the edges of the dissepiments in the interior glabrous.

Var. *α*, *vulgare.*

Tall; seeds dark.

Var. *β*, *crepitans.*

L. humile, "*Mill.*" *Planch.* l. c.
L. crepitans, *Dumort.* (?) Fl. Belg. Prod. III.

"Smaller and more branched; capsules opening with elasticity. Seeds paler." (Bab. Man.).

In cultivated fields and other places, but not permanently naturalized in Britain, though often occurring, from the seeds being accidentally dropped, or from the remains of flax culture.

[England, Scotland, Ireland]. Summer and Autumn.

A much stouter plant than either of the preceding, with the stems less wiry, 1½ to 2 feet high, solitary, or two or three from the crown of the root. Leaves much larger, ¾ to 1¾ inch long; they are also broader and more flaccid. Flowers ¾ to ⅝ inch across, with the petals contiguous, rather dull purplish-blue. The sepals resemble those of L. angustifolium, but the outer and inner are more nearly alike in shape, and the petals are more distinctly crenate at the apex. The capsule is much larger, ⅜ to ½ inch across, and has a shorter mucro. The seeds are considerably larger.

In this species, as in L. angustifolium, there is no very marked dimorphism in the flowers.

I am quite unacquainted with the var. β, and give it only on the authority of Professor Babington's "Manual."

Common Flax.

French, *Lin Cultivé, Lin Usuel.* German, *Gewöhnlicher Lein.*

Of the many foreign and cultivated species of the Flax plant, not one of them has greater beauty than the Flax of commerce, whose blossoms of turquoise blue waving on its slender stems give so great a charm to the spring aspect of flax-growing countries. As an article of manufacture and commerce it has considerable value and great antiquity. Probably the very first fibre used in textile manufacture was Flax fibre We find frequent mention of it in the early Hebrew Scriptures; and when the Israelites were in bondage in Egypt, it would appear to have been a common field crop. In the ninth chapter of the book of Exodus, after the description of the fearful hail-storms mingled with fire with which the Egyptians were visited, on account of their obstinacy and disobedience, it is said: "And the flax and the barley was smitten, for the barley was in the ear and the flax was bolled," or risen in the stalk. Flax as a manufactured article is alluded to in Genesis: "And Pharaoh took off his ring from his hand and put it upon Joseph's hand, and arrayed him in vestures of *fine linen*." This is, perhaps, the first mention made of an article which has from that time been in constant use by Eastern nations, and has extended with the progress of civilization all over the world. Herodotus tells us that linen (so called from the word *lin*, a fibre, as also from the name of the plant) was the common material for clothing among the Egyptians, and that Egypt was the great emporium of the Flax trade. Solomon purchased linen yarn in Egypt (2 Chron. i. 16), and Pliny tells us that the Egyptians were the first to make textile fabrics. The question as to the nature of the cere-cloth in which this people used to envelope their dead has been satisfactorily settled by the aid of the microscope, and there can now be no doubt that mummy cloth is a coarse sort of linen fabric, the peculiar appearance of the Flax fibre being easily distinguished from the hairs of the cotton plant or any other material. We read of a linen corselet preserved in the Temple of Minerva at Lindus, in Rhodes, which had belonged to the Egyptian king Amapis six hundred years before Christ, and in Pliny's time some mutilated remains of this corselet were still in existence. Pliny gives us a long account of the uses of Flax among the Romans, with whom, however, it was not a common article of clothing. He speaks of its use in navigation in very enraptured terms, and extols the frail plant which has so wonderfully enabled man to cross the ocean, and which brought "Ostia within six days of Gades, near the Pillars of Hercules," a passage which reads as

strangely in these days of steam as his horror of the sea and his denunciation of the "boldness and criminal perverseness" of man in navigating it, appears to the descendants of the Vikings. He speaks of "flaxen nets being so fine as to pass through a ring, and of one man carrying as many as would encompass a forest, threads being thinner than a spider's web, yet strong as a lute-string;" statements which we must allow partake somewhat of Eastern hyperbole. Although the use of linen fabric was common to the Romans, they appear rather to have preferred woollen garments, and Alexander Severus, the emperor, was the first Roman who wore a linen shirt. From the countries of the Mediterranean the use of Flax spread throughout Europe. It has a remarkable range of temperature, thriving from the fields of Northern Europe to the tropical plains of India. This quality and the short summer really necessary to bring the plant to perfection recommended its culture to northern nations. Mention of it occurs in the Sagas of the ninth and tenth centuries, and its general use among the Norsemen at that period is certain from passages in "Rigsmaal" and other poems; moreover, we have the record of a tax being levied on Flax at the beginning of the eleventh century. In England we have no proof of its cultivation before the Conquest, and it does not appear in the list of taxed articles until 1175. In 1531 a law was passed to compel one rood in every sixty acres of arable land to be sown with Flax or Hemp; and it seems then to have been the custom for every farmer to sow a small quantity for the use of his family; for Tusser says:—

> "Good Flax and good Hemp for to have of hir owne,
> In Maie a good huswife wil see it be sowne;
> And afterward trim it, to serve at a neede,
> The fimble to spin, and the karl for hir seede."

The very exhausting nature of the crop has, however, always prevented its extensive cultivation in England. This quality was well known to the ancients, and Pliny asserts that it "scorches the ground." In many parts of the country clauses are still inserted in the leases to prevent the farmer from growing Flax, though with the present scientific mode of farming it may be done judiciously and without injury to the soil. At a very early period the culture of Flax became of great importance to the Irish, and the "Brehon laws," unwritten but delivered by tradition from one to another, declared that every farmer should be legally obliged to acquire a full acquaintance with the best mode of working and dressing it. It is curious to read passages in old writers concerning the extensive use and manufacture of linen in Ireland in the year 1581. Edward Campion, the Jesuit, declares of the "meere Irish" that "linen shirts the rich do weare for wantonesse and bravery with wide hanging sleeves playted;" and adds: "Thirtie yards are little enough for one of them." Spenser the poet, too, declaring the inefficiency of the laws against the "wearing of Irish apparel," enumerates amongst other enormities "the greate linen roll which the women weare to keep their heads warm after cutting their haire." We learn that the queen of Charles VII. of France, the contemporary of our Henry VI., rejoiced in the possession of two linen undergarments, a supply which would be considered rather scanty in these times. Flax is grown in large quantities in the alluvial soils of Lincolnshire and in the Eastern counties. In Ireland it flourishes extensively, and the manufacture of linen is one of the chief resources of the country. Its cultivation requires care and a suitable soil to secure a good crop. We learn from agricultural authorities that it succeeds best in deep and friable loams, such as contain a large proportion of vegetable matter. Strong clays do not answer well, nor such as are of a gravelly or sandy nature. There are

many circumstances to be taken into account in the choice of land for a Flax crop, which are fully explained in agricultural works. When a fine fibre is required, the Flax should be sown thickly, but more sparingly for coarser qualities. It is generally sown in March or April on land carefully prepared and kept free from weeds by a long course of ploughing. Much manure is required; rape-cake is recommended, and peat-ashes are said to be particularly serviceable. Flax is best when gathered when it is in full flower; but this is seldom done, as the seed is almost as valuable as the fibre. The crop is gathered by hand, and the plants are pulled up by the roots and collected into bundles. Experience has shown that when the blossom has just fallen, when the stalks begin to turn yellow, before the leaves fall, the fibres are softer and stronger than if left standing till the seed is quite matured. The seeds will ripen after the plant is gathered, if they be allowed to remain on the plant for a time. The Dutch avail themselves of this fact with regard to their Flax crop. After pulling the plants they stack them. The seeds by this means ripen, while the fibres are collected at the most favourable period of their growth. They thus obtain both of the valuable products of the plants, and supply their less careful neighbours with the seeds.

After the plants have been pulled and sorted, they are usually laid in handfuls across the field, or loosely tied in large bundles and set upright. All Flax growers do not follow precisely the same plan in this respect; many dispense with drying the crops altogether. In some parts of France the Flax is left on the field for a day or two. In Yorkshire the sheaves are taken immediately to the watering-place. The first operation which Flax undergoes is called "rippling," and this can be performed equally well whether the plants be green or dry. This is done to free the stalk from the leaves and seed-pods called bolls. The ripple is a kind of coarse comb, consisting of six or eight triangular teeth set in a narrow piece of wood so that their bases nearly touch each other. This being firmly fixed on a beam of wood, two persons sit, one at each end, and draw the flax in handfuls repeatedly through this ripple; in a very short time the stems become quite free and clean. If the seed is to be preserved, a large cloth is laid underneath to catch the pods as they fall; these are laid out in the sun to dry, and the seeds are carefully sifted away from the husk. Those which separate spontaneously are reserved for sowing. The delicate fibres of Flax intended for cambric would be injured by the use of the ripple, so the stalks are cleaned either by a wooden knife or the use of a mallet. To obtain the fibre which lies between the bark and the wood, the plant is now steeped in water until decomposition commences, and the fibres set free from the gummy sap by which the bark adheres to them. This process is called "water retting," and usually occupies ten or twelve days. The decomposition of so large a quantity of vegetable matter in contact with water is found to be very injurious both to the purity of the atmosphere and the streams in which the Flax is placed. An Act was passed in the reign of Henry VIII. forbidding the watering of Flax or Hemp in any common pond or where cattle drink, and this Act still continues in force; canals are therefore generally dug for the purpose. Other plans have been suggested for obtaining the fibre without the annoyances of this water retting. A Mr. Lee, of Middlesex, invented a process by which, with the aid of soft soap and machinery, the fibre is more completely separated than by steeping, and in a better state. In 1810 a patent was granted to Mr. Lee for this invention, but it has not been generally adopted. In Sweden the stalks are boiled in a mixture of sea-water, lime, and birch-ashes, and afterwards cleansed with soap. There are few branches of manufacture in which inventors have been more busy than in the preparation

of this valuable fibre. After the disengagement of the fibres by water retting, they are again subject to a process called "scutching," which still further cleanses them. The fibres are then disentangled, and rendered fit for the manufacturer by another operation called "heckling," which consists in passing them through the teeth of a comb, varying in width according to the purpose for which the Flax is destined. The rough and broken fibres which are detached from the skein during the process of heckling form the article called "codilea" or "tow," which is much used by surgeons and others. Several chemical processes have lately been introduced by which the fibres of Flax can be so finely divided as to appear like cotton. Berthollet made many experiments in bleaching Flax, and was able to reduce the finest Flax and the coarsest hemp to one uniform fineness of fibre and colour, so that even the refuse from rope-walks might be made into a substance valuable in the arts. The finest thread which has been produced in England by machine-spinning measures 12,000 yards spun from one pound of Flax; though by hand-spinning the process has been carried as high as 36,000 yards to the pound.

It is not, however, only for its valuable fibre that the Flax plant is cultivated; the seed is a considerable article of commerce and consumption under the name of "linseed." These seeds contain a mucilaginous and oleaginous substance, which recommends them in infusion for colds and coughs. The chief value of the seeds consists, however, of the oil which they contain, and which is expressed from them without the aid of heat. It is largely used in the arts and manufactures, and as it dries readily is useful for painting. When boiled it becomes of a brown colour, dries more rapidly, and in this state enters into the composition of printers' ink. When freshly expressed it contains mucilage, which is deposited by keeping, and may be separated by agitation with water, or filtering through charcoal. The seeds yield about twenty per cent. of oil when expressed in the cold state, but considerably more when heated, of inferior quality. When shaken with lime-water, linseed oil forms a white emulsion, which is the officinal Carron oil, once in universal use as a remedy for recent burns.

The cake which remains after expressing the oil is familiarly known by the name of "oil-cake;" or, when ground up, of "linseed meal." This cake is used largely in feeding cattle, and makes them very fat, but renders their flesh coarse; it is also used as a manure. The meal is one of the cheapest and best of all articles for making poultices. Linseed has occasionally been employed as human food; but it is apparently unwholesome. During the famine at Walcheren, in the sixteenth century, some people at Middleburg ate linseed; they were attacked with swellings of the face and body, and many eventually died. Linseed oil enters into the Veterinary Pharmacopœia as a purgative for sheep and horses. A jelly formed by boiling the seeds in water, mixed with barley-meal, bran, and cut chaff, is considered to be excellent food for bullocks and live stock generally. Mixed with honey, linseed oil has been used as a cosmetic for removing spots from the face. Linseed is also employed as food for small birds. With all this mass of useful and commercial properties, we must not forget to mention that this lovely little plant is at once recommended to us by its exquisitely delicate and beautiful appearance, of which poets have sung, and the less prosaic peasantry of Continental nations have associated with their fêtes and rejoicings. Coleridge says:—

> "The unripe Flax,
> When through its half-transparent stalk at eve
> The level sunshine glimmers with green light."

The custom of attributing particular meanings to flowers has been common in all

ages and in many countries. The Welsh, Germans, and others consider the Flax, with its transparent blue flower, as emblematical of friendship; and so the Egyptian predilection for this pretty plant is supposed by some to have arisen from its azure blossom, resembling the blue colour of the sky.

ORDER XX.—GERANIACEÆ.

Herbs, undershrubs, or shrubs, frequently clothed with glandular pubescence. Leaves opposite or alternate, usually more or less deeply lobed or divided, generally furnished with stipules. Peduncles commonly axillary, 1- or 2-flowered or many-flowered and sub-umbellate, rarely in cymes or racemes. Flowers perfect, regular or irregular, often handsome and brightly coloured. Sepals 5, free (or more rarely united at the base), imbricated (rarely valvate), the posterior one sometimes spurred. Petals as many as the sepals (more rarely fewer or none by abortion), hypogynous or slightly perigynous, imbricated. Torus scarcely expanded into a disk, frequently with 5 small glands alternate with the petals, generally produced in the centre of the ovary as far as the point where the ovules are inserted or beyond it. Stamens twice as many as the sepals (or more rarely thrice as many or only as many), some of them frequently without anthers. Filaments sometimes dilated at the base where they are united into a short ring, sometimes filiform and free. Anthers versatile and 2-celled, with a very slender connective. Ovary 5- or 3-lobed, consisting of as many carpels and cells as there are lobes; the carpels united to the torus as far as the insertion of the ovules, or prolonged into beaks, which adhere to the prolonged torus. Styles as many as the carpels, free or more or less united. Ovules in each cell 1, 2, or more. Fruit a 3- or 5-lobed capsule with 1-seeded cells separating from the axis, or with 2- or more seeded cells dehiscing loculicidally; cells rarely berry-like and many-seeded, either remaining attached to the axis or separating from it with elasticity. Seeds generally without an arillus. Testa membranaceous or rarely hard. Albumen small in quantity or none, rarely more abundant and fleshy. Embryo with the cotyledons frequently foliaceous and green. Radicle sometimes straight and directed towards the hilum, sometimes longer, curved, and lying on the back of the cotyledons.

Sub-Order I.—GERANIEÆ.

Flowers regular or irregular. Sepals herbaceous, persistent, free, equal or the uppermost one spurred at the base. Petals caducous, free. Stamens 10 (rarely 15), with frequently some of them without anthers; filaments often dilated and united into a short ring at the base. Torus produced beyond the insertion of the ovules, forming an axis to which the beaks of the carpels are attached. Carpels 5 in number, 1-seeded, separating from the axis with elasticity when ripe. Albumen none. Radicle bent.*

GENUS I.—GERANIUM. *Linn.*

Flowers regular. Sepals 5, persistent, free, imbricated, the upper one not spurred. Petals 5. Glands 5, alternate with the petals. Stamens 10, generally all antheriferous, rarely 5 of the filaments without anthers. Capsule consisting of 5 separable cocca with long beaks which are glabrous on the inner face. Axis forming a central column, from which the beaks of the different carpels separate and roll up from the base towards the apex without twisting like a corkscrew.

Annual or perennial herbs (rarely undershrubs), often more or less hairy. Stems enlarged at the joints. Leaves palmately veined and palmately lobed, cut or divided; the lower ones on long stalks; the uppermost ones sessile; those on the upper part of the stem opposite. Peduncles in the forks of the stem or occasionally axillary by the suppression of the branches of the cyme on one side, bracteated at the apex, 2-flowered, more rarely 1-flowered. Flowers purple, rose, lilac, or white, often veined, on pedicels which are generally reflexed after flowering, but incurved at the apex, so that the young fruit is erect.

The name of this genus comes from the Greek word γερανος (*geranos*), a crane, because the long beak which terminates the carpels resembles the bill of the crane.

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* Although I have followed Dr. Hooker and Mr. Bentham in the definition of Geraniaceæ, I have thought it better to restrict Geranieæ to the order Geraniaceæ as commonly received, which differs from the Geranieæ of the above-mentioned authors by the exclusion of Biebersteinia and the addition of Pelargonium, as given at page 271 of "Genera Plantarum."

Section I.—EU-GERANIUM. *Gr. & Godr.*

Calyx spreading in flower. Claw of the petals much shorter than the lamina, which is generally truncate or notched at the apex.

SPECIES I.—GERANIUM SANGUINEUM. *Linn.*

PLATE CCXCIII.

Reich. Ic. Fl. Germ. et Helv. Vol. V. *Geran.* Tab. CXCVII. Fig. 4894.

Rootstock horizontal, premorse, elongated, thick, scaly, with long branches. Stems erect or decumbent, dichotomously branched, hairy. Leaves all opposite and similar, roundish-angular in outline, 5- to 7-partite, with each of the segments wedge-shaped and 3-cleft. Flowers solitary. Peduncles from the axils of the leaves, rarely from the forks of the stem, 1-flowered. Petals much longer than the sepals, notched at the apex. Carpels hairy, smooth. Seeds very finely pitted.

Var. *α*, *genuinum.*

Stem erect or ascending, sparingly hairy. Leaves with the segments divided nearly to the base; ultimate lobes with straight sides.

Var. *β*, *prostratum.*

G. lancastriense, *With.* ed. iii. Vol. III. p. 600.
G. prostratum, *Cav.* *Lindl.* Syn. Brit. Fl. p. 58.

Stems decumbent, copiously hairy. Leaves with the segments divided two-thirds or three-quarters down towards the base; Ultimate lobes with curved sides.

Var. *α* on limestone and trap rocks. Var. *β* on sandy sea shores. Rather rare, but pretty generally distributed, except in the extreme North of Scotland.

England, Scotland, Ireland. Perennial. Summer and Autumn.

Tap-root soon decaying, so that it disappears in old plants. Rootstock branched, in var. *α* seldom exceeding 3 or 4 inches (but in var. *β* the branches are sometimes nearly 1 foot long in old plants), brown, sparingly scaly except at the apex where it is densely so. Stems dichotomously branched, somewhat geniculate, 1 to 2 feet long in var. *α*, generally shorter in var. *β*. Leaves all nearly alike in size and shape, $1\frac{1}{2}$ to 2 inches across, with the primary segments scarcely contiguous; segments generally 7, each divided to about the middle into 3 strap-shaped lobes, which are longer and

more acute in var. α than in β. Peduncles long, with a pair of ovate-acuminate brownish bracts at the apex, from which a single pedicel is produced, which is shorter than the peduncle. Flowers 1 to 1½ inches across, deep crimson. Sepals ovate-elliptical, obtuse, 3- or 5-nerved, the middle nerve extending beyond the sepal, and forming a short awn; nerves with long white hairs like those on the stem. Petals deltoid-obovate, spreading so as to make the corolla very slightly concave. Fruit, including the beak, about 1¼ inch long, with short scattered hairs; the carpels quite smooth, but the seeds with minute pits all over their surface. Plant green, with rather firm leaves; stem with long white spreading hairs; leaves with shorter adpressed ones.

Var. β differs considerably in habit from var. α. The stems are more numerous and decumbent, or even prostate, and the leaves appear to be less divided from the segments being shorter, broader, and less acute; these characters are constant in cultivation, but are too slight to entitle it to be ranked as a sub-species. A curious form of var. β, the G. lancastriense of Withering, has been found at Walney Island, Lancashire. It has the flowers white or pale pink with red veins, and these colours are hereditarily constant, though it differs in no other particular from the ordinary sea-shore plant.

Bloody Crane's Bill.

French, *Géranium Sanguin.* German, *Blutrother Kranichschnabel.*

The beautiful red flowers of this pretty plant recommend it to all lovers of wild flowers. Its mallow-like flowers seem to connect it with the Eastern notion that Geraniums were at first simply mallows, until Mahomet, delighted with the fine texture of a sheet made for him of mallow fibres, changed the plant into the more beautiful Geranium.

SPECIES II.—GERANIUM PHÆUM. *Linn.*

PLATE CCXCIV.

Reich. Ic. Fl. Germ. et Helv. Vol. V. *Geran.* Tab. CXCVII. Fig. 4891.

Rootstock premorse, horizontal, short, thick, scaly, with very short branches. Stems erect, nearly simple, hairy. Radical leaves on long stalks, reniform-angular, 5-cleft, with the lobes oval-rhomboidal, rather acute, slightly cut and serrate; lower stem leaves alternate, on shorter stalks; the upper ones opposite, sessile, with the lobes narrower and more acute. Flowers sub-racemose. Peduncles from the axils of the leaves and forks of the stem when it branches, 2-flowered. Petals slightly exceeding the sepals, roundish, denticulate and generally apiculate at the apex. Carpels hairy, transversely wrinkled towards the top. Seeds smooth.

In woods, and the neighbourhood of parks and gardens, but in

no localities in which it is quite free from the suspicion of having been introduced, although it is well established in a great number of stations both in England and Scotland.

[England, Scotland]. Perennial. Summer.

Rootstock very thick and scaly, with the branches extremely short, producing leaves and flowering stems; the latter 1½ to 2½ feet high, nearly simple. Root leaves 4 or 5 inches across, with the stalks 6 to 8 inches long; stem leaves becoming smaller and more nearly sessile the higher they are placed on the stem. Peduncles arranged in a pseudo-raceme towards the apex of the stem, about as long as the pedicels, of which two are produced from each peduncle. Flowers ¾ inch across, dark dull purple, rarely bright purple or white. Sepals oblong-elliptical, obtuse, shortly awned. Petals quite contiguous, spreading at right angles to the pedicel, so that the corolla is perfectly flat. Fruit about 1 inch long including the beak, which is finely hairy; the carpels with a few transverse wrinkles at the top, and some long hairs on the back. Plant green, with soft flaccid leaves. Stem with white spreading hairs; and besides these, short glandular ones on the upper part and on the peduncles and sepals; leaves with adpressed hairs.

Dusky Crane's Bill.

French, *Géranium Brun.* German, *Rothbrauner Kranichschnabel.*

SPECIES III.—GERANIUM NODOSUM. *Linn.*

PLATE CCXCV.

Reich. Ic. Fl. Germ. et Helv. Vol. V. *Geran.* Tab. CXCV. Fig. 4887.

Rootstock horizontal, premorse, elongated, rather thick, scaly (especially at the apex), with very short branches. Stems erect, slightly branched, glabrous. Radical leaves on long stalks, angulated-reniform in outline, 5-cleft, with the lobes ovate-oval, acuminated, coarsely and unequally serrate; lower stem leaves like the radical leaves; uppermost ones on shorter stalks, with 3 lanceolate-acuminate lobes, the lateral lobes spreading. Flowers in an irregular terminal cyme. Peduncles from the forks of the stem or axillary, 2-flowered. Petals much longer than the sepals, wedge-shaped-spathulate, deeply notched at the apex. Carpels hairy with a single transverse wrinkle at the apex. Seeds finely pitted (under a lens).

In woods, but only where it has been planted, though it appears to have been naturalized for a great length of time. I have seen

specimens only from Kirklington, Yorkshire; but it has been reported from other places in that county, and from Cumberland and Hertfordshire.

[England]. Perennial. Summer.

Stem 1 foot to 18 inches high, flexuous. Radical leaves 3 or 4 inches across, with footstalks 4 or 5 inches long; upper leaves much smaller. Peduncles very long. Pedicels short. Flowers 1 inch across, pale purple. Sepals oblong-obtuse, awned, with scarious margins. Petals rather suddenly enlarged towards the tip, connivent at the base and spreading at the apex, so that the corolla is bell-shaped. Plant light green, glabrous, except the peduncles, pedicels, and base of the sepals, which are downy. The fruit is also downy, and the margins of the carpels hairy. The bracts are longer and more acuminate at the apex than in the other rhizomatous British species of Geranium, with none of which, indeed, can it be confounded.

Knotty Crane's Bill.

French, *Géranium Noueux.*

SPECIES IV.—GERANIUM SYLVATICUM. *Linn.*

PLATE CCXCVI.

Reich. Ic. Fl. Germ. et Helv. Vol. V. *Geran.* Tab. CXCIII. Fig. 4882.

Rootstock horizontal, premorse, rather short, very thick, densely scaly, with very short branches. Stems erect, simple below, dichotomously branched above, with short hairs. Radical leaves on long stalks, angulated-roundish in outline, deeply 7- to 9-cleft, with the segments rhomboidal, contiguous, acute, irregularly cut and coarsely serrate at the margins; lower stem leaves alternate, on short stalks, resembling the radical ones, but with narrower, shorter and more deeply-cut lobes; upper stem leaves sub-sessile; uppermost ones with the lobes 5 or 3 in number and much smaller. Flowers numerous, in a dichotomous cyme. Peduncles in the forks of the stem and terminal, 2-flowered, not deflexed after flowering. Petals much longer than the sepals, obovate, truncate and repand at the apex. Filaments tapering gradually from the base to the apex. Carpels hairy, smooth. Seeds smooth, but appearing finely reticulated-striate under a powerful lens.

In woods and hilly pastures. Common in the North of England and in Scotland, but rare South of Yorkshire and Lancashire, though reported from the counties of Norfolk, Warwick, and Worcester.

England, Scotland, Ireland. Perennial. Summer.

Stem 1 to 3 feet high. Root leaves 3 to 5 inches across, with petioles 6 to 12 inches long. Peduncles rather long, exceeding the pedicels, not bent down after flowering as in all the preceding, and most of the following species. Flowers 1 inch across, bluish-purple, with the veins not conspicuously different, except in a white-flowered variety with red veins which was found by myself in Castle Campbell Wood, Clackmannanshire. Sepals elliptical, obtuse and emarginate at the apex, awned, with broad membranous margins clothed with gland-tipped hairs. Petals spreading so that the corolla is slightly concave. Fruit, including the beak, 1 to 1¼ inch long, the carpels with adpressed hairs but no wrinkles. Seeds oblong-ovoid, dark olive, with faint longitudinal raised lines close to each other and connected by transverse ones. Whole plant light green, with the leaves soft and flaccid, sparingly pubescent, with short reflexed hairs on the lower part of the stem, and shorter and closer gland-tipped ones on the upper part of the stem, peduncles and pedicels, and still shorter adpressed hairs on the leaves.

Wood Crane's Bill.

French, *Géranium des Bois.* German, *Wald Kranichschnabel.*

SPECIES V.—GERANIUM PRATENSE. *Linn.*

PLATE CCXCVII.

Reich. Ic. Fl. Germ. et Helv. Vol. V. *Geran.* Tab. CXCIII. Fig. 4883.

Rootstock horizontal, premorse, rather short, very thick, scaly, with very short branches. Stems erect, generally simple below, dichotomously branched above, with very short hairs. Radical leaves on long stalks, angulated-roundish, very deeply 7- to 9-cleft, with segments narrowly rhomboidal, not contiguous, acute, irregularly and deeply pinnatifid, with the ultimate lobes strap-shaped, acute, entire. Stem leaves with narrower segments; the uppermost leaves opposite, sessile, 5- or 3-lobed, with the lobes much smaller. Flowers numerous, in a terminal dichotomous cyme. Peduncles in the forks of the stem and terminal, 2-flowered, deflexed after flowering. Petals much longer than the sepals, broadly obovate, rounded at the apex. Filaments with an ovate-triangular base, suddenly contracted below the middle into a subulate apical portion. Carpels hairy, smooth. Seeds closely covered with minute pits.

Meadows and waste places, especially by the sides of rivers. Rather common, and generally distributed except in the extreme North of Scotland.

England, Scotland, Ireland. Perennial. Summer and Autumn.

This fine species bears considerable resemblance to G. sylvaticum; but it is a larger plant, being from 15 inches to nearly 4 feet high. The leaves are larger, but with the segments narrower, and consequently not generally contiguous; their margins are more deeply divided, so that what are merely large serratures in G. sylvaticum are represented by lobes in G. pratense. The flowers are considerably larger, from 1¼ to 1½ inch across; the petals broader, purplish-blue veined with reddish purple, though occasionally, like those of most of the genus, white. The sepals are larger, more oblong, and with longer awns at the apex. The stamens do not taper gradually from the base to the apex, but are much dilated at the bottom. The fruit is longer, often 1½ inch long. The seeds have distinct pits on their surface, instead of cells formed by the intersection of raised lines. The hairs on the stem and veins of the leaves beneath are shorter, closer, and more reflexed. The upper part of the stem, peduncles and veins of the sepals are more thickly clothed with gland-tipped hairs.

Blue Meadow Crane's Bill.

French, *Géranium des Prés.* German, *Wiesen Kranichschnabel.*

SPECIES VI.—GERANIUM PYRENAICUM. *Linn.*

PLATE CCXCVIII.

Reich. Ic. Fl. Germ. et Helv. Vol. V. *Geran.* Tab. CXCII. Fig. 4881.

Tap-root permanent. Root-stock vertical, forming a continuation of the tap-root, very short, thick, scaly, many-headed. Stems erect or ascending, often decumbent at the base, dichotomously branched above, with scattered hairs. Radical leaves on long stalks, reniform-roundish, 7-cleft, with the segments contiguous, oblong-wedgeshaped, truncate and irregularly 3-cut at the apex, deeply crenate, with the central crenature somewhat obtuse; upper leaves resembling the radical ones, but approaching to semicircular-reniform in outline, with the segments narrower and having only 3 small blunt or pointed lobes at the apex. Flowers very numerous, in an irregular dichotomous cyme, the branches of which are racemose. Peduncles in the forks of the stem and axils of the leaves, 2-flowered. Bracts strap-shaped-lanceolate. Petals twice as long as the sepals, wedgeshaped-obovate, obcordate at the apex, ciliated above the claw. Filaments ciliated at the base. Carpels downy, smooth. Seeds smooth.

On pastures and roadsides. Not uncommon, but probably introduced in many of the localities, especially in those in the North of England and Scotland. Mr. Baker considers it undoubtedly

native in Yorkshire; it is not uncommon about Edinburgh, but only in places where it is not unlikely to have been introduced.

England, Scotland? Ireland. Perennial. Summer and Autumn.

Tap-root long, tapering, blackish, terminating above in an extremely short many-headed rootstock which is not premorse as in the preceding species, as the root does not decay during the life of the plant. Stems numerous, ascending or sub-erect, often decumbent at the base, 6 inches to 2 feet long. Radical leaves numerous, 1½ to 3 inches across, quite flat with the segments nearly contiguous, on leafstalks 3 to 8 inches long; the upper leaves become gradually smaller, and have the segments separated by a triangular sinus, and terminated by 3 large teeth or small lobes. Peduncles about as long as the pedicels, deflexed after flowering. Flowers ½ to ¾ inch across, bright reddish purple. Sepals lanceolate-oval, scarcely mucronate. Fruit ¾ inch long. Stems, peduncles, and bracts with spreading white hairs; leaves and the margins of the sepals with shorter adpressed ones; besides which the stem, peduncles and sepals are thickly clothed with extremely short gland-tipped hairs.

This species cannot be mistaken for any of the preceding, as there is no horizontal premorse rhizome; indeed, in general habit it closely approximates the annual species which follow, though the flowers are larger than in any of them.

Mountain Crane's Bill.

French, *Géranium des Pyrénées.* German, *Pyrenäischer Kranichschnabel.*

SPECIES VII.—GERANIUM MOLLE. *Linn.*

PLATE CCXCIX.

Reich. Ic. Fl. Germ. et Helv. Vol. V. *Geran.* Tab. CXCI. Fig. 4879.

Tap-root annual or biennial. Stems ascending or decumbent, dichotomously branched, hairy. Radical leaves stalked, roundish, deeply 7- to 9-cleft, with the segments contiguous, wedge-shaped, truncate and irregularly cut or lobed at the apex; lobes scarcely longer than broad, rather obtuse or even rounded at the apex; upper leaves resembling the others, but semicircular-reniform in outline, with the segments much narrower and having the lateral lobes at the apex much smaller; uppermost leaves with 5 simple lobes. Flowers very numerous, in an irregular dichotomous cyme, the branches of which are racemose. Peduncles in the forks of the stem and in the axils of the upper leaves, 2-flowered. Bracts ovate-lanceolate. Petals as long as or half as long again as the

sepals, wedgeshaped-obovate, obcordate at the apex, ciliated above the claw. Filaments glabrous. Carpels transversely wrinkled with prominent ridges, glabrous, keeled on the back. Seeds smooth.

In meadows, hedgebanks, and by roadsides and waste places. Very common and generally distributed.

England, Scotland, Ireland. Annual or Biennial. Spring to Autumn.

Resembles G. pyrenaicum, but smaller. Tap-root much more slender, and the rhizome present only in those plants which do not flower until the second year. Stems 6 to 18 inches long, weak. Root leaves 1 to 2 inches in diameter; the segments with narrower lobes than in G. pyrenaicum, and entire (not crenate). Peduncles of the upper flowers shorter than their pedicels. Flowers much smaller, $\frac{3}{8}$ to $\frac{1}{2}$ inch across, of a paler and redder purple, or purplish rose-colour. Carpels conspicuously transversely wrinkled, and without hairs. Hairs of the stem, peduncles, pedicels and calyx long and white, rather close. Glandular hairs on the pedicels, peduncles and sepals fewer. Bracts much shorter and broader.

Soft Crane's Bill.

French, *Géranium Mollet.* German, *Weicher Kranichschnabel.*

This species is also called "Dove's Foot Crane's Bill."

SPECIES VIII.—GERANIUM PUSILLUM. *Linn.*

PLATE CCC.

Reich. Ic. Fl. Germ. et Helv. Vol. V. *Geran.* Tab. CXC. Fig. 4877.
G. rotundifolium, *Fries,* Nov. Fl. Suec. I. p. 212.

Tap-root annual or biennial. Stems ascending or decumbent, dichotomously branched, finely hairy or sub-glabrous. Radical leaves stalked, roundish, deeply 7- to 9-cleft, with the segments scarcely contiguous, wedge-shaped, truncate and irregularly cut or lobed at the apex; lobes longer than broad, rather obtuse or rounded; upper leaves resembling the others, but semicircular-reniform in outline, with the segments and the lobes at their apex much narrower; uppermost leaves with 5 simple lobes. Flowers very numerous, in an irregular dichotomous cyme, the ultimate branches of which are racemose. Peduncles in the forks of the stem and in the axils of the leaves, 2-flowered. Bracts linear-acute. Petals nearly equalling the sepals, wedgeshaped-obovate, deeply emarginate at the apex, ciliated above the claw. Filaments ciliated at the base. Carpels without transverse wrinkles, downy, keeled on the back. Seeds smooth.

In hedgebanks, roadsides, and waste places. Common, and generally distributed except in the extreme North of Scotland, but often passed over from its resemblance to G. molle.

England, Scotland, Ireland. Annual. Spring to Autumn.

Extremely like G. molle, but the segments even of the root-leaves are not contiguous; the flowers are smaller and paler in colour; the anther-bearing stamens often only 5 in number; and the whole plant less hairy. The very different carpels, are however, by far the best means of separating the two; in the present species there are none of the transverse ridges which are so conspicuous in G. molle, and instead of being glabrous they are downy with short hairs.

Small-flowered Crane's Bill.

French, *Géranium Fluet.* German, *Niedriger Kranichschnabel.*

SPECIES IX.—GERANIUM ROTUNDIFOLIUM. *Linn.*

PLATE CCCI.

Reich. Ic. Fl. Germ. et Helv. Vol. V. *Geran.* Tab. CXC. Fig. 4878.
G. viscidulum, *Fries,* Nov. Fl. Suec. I. p. 217.

Tap-root annual or biennial. Stems ascending or decumbent, dichotomously branched, hairy. Radical leaves stalked, roundish, 5- to 7-cleft, with the incisions between the segments shallow; the segments contiguous, broadly wedge-shaped, truncate and irregularly cut and crenate at the apex. Stem leaves resembling the root leaves, but on shorter stalks; the uppermost smaller, semicircular-reniform, with 5 not contiguous ovate or elliptical entire lobes. Flowers numerous, in an irregular dichotomous cyme, the ultimate branches of which are racemose. Peduncles in the forks of the stem and axils of the leaves, 2-flowered. Bracts lanceolate-acuminate. Petals half as long again as the calyx, wedgeshaped-oblanceolate, obtuse or rounded (not emarginate) at the apex, glabrous above the claw. Filaments glabrous. Carpels without transverse wrinkles, keeled on the back, hairy. Seeds pitted.

In hedgebanks, waste places, and by roadsides. Rather rare, and probably native only in the southern half of England; for although the plant has been gathered as far North as Northumberland, it has probably been introduced with ballast.

England, Ireland. Annual or Biennial. Spring to Autumn.

In size and general habit this species closely resembles the two preceding, but the leaves are much less deeply divided, and the

segments more contiguous or even slightly overlapping; the flowers are generally larger, sometimes ½ inch across, but less conspicuous than those of G. molle from their pale flesh-coloured narrow petals; the petals indeed in their shape show an affinity with G. Robertianum and G. lucidum. The sepals in fruit are much larger than in either G. pusillum or G. molle, being nearly twice as long as the ripe carpels; these last are without transverse wrinkles, resembling those of G. pusillum, but the hairs are much longer and spreading, not short and adpressed as in that species. The seeds with numerous excavated pits approach those of G. dissectum and G. columbinum; which, however, differ widely in their leaves. The leaves are very soft and flaccid, pale whitish-green, very different from that of any of the other British species; and by this characteristic the plant, when growing, may be distinguished from its nearest allies at some distance.

Round-leaved Crane's Bill.

French, *Géranium à Feuilles Rondes.* German, *Rundblättriger Kranichschnabel.*

SPECIES X.—GERANIUM DISSECTUM. *Linn.*

PLATE CCCII.

Reich. Ic. Fl. Germ. et Helv. Vol. V. *Geran.* Tab. CLXXXIX. Fig. 4876.

Tap-root annual or biennial. Stems ascending or decumbent, dichotomously branched, hairy. Root leaves stalked, angulated-roundish, deeply 7-cleft with the segments not contiguous, wedge-shaped-truncate, deeply 3- to 5-lobed at the apex; stem leaves on shorter stalks, 7- or 5-partite, the lower ones with the segments strap-shaped, with one or two long strap-shaped ascending lobes on each side; uppermost leaves with the segments often simply strap-shaped and entire. Flowers very numerous, in a dichotomous cyme, the ultimate branches of which are racemose. Peduncles in the forks of the stem and in the axils of the upper leaves, 2-flowered, shorter than the leaves. Bracts linear-acute. Sepals oblong-lanceolate, rounded at the base, awned, flat. Petals as long as the calyx, obovate, deeply notched at the apex. Filaments strongly ciliated towards the base. Carpels smooth (not transversely wrinkled), not keeled at the back, hairy. Seeds pitted.

In fields, hedgebanks, roadsides, and waste places. Very common and generally distributed.

England, Scotland, and Ireland. Annual or Biennial. Spring to Autumn.

Stems straggling, 6 inches to 2 feet long. Radical leaves on rather short stalks, generally withered before the plant is in full

flower; stem leaves shortly stalked, all opposite, 1½ to 2 inches across, with the ultimate lobes of the pinnatifid segments long and narrow. Flowers ¼ to ⅜ inch across, bright red. Peduncles and pedicels shorter than in most of the genus. Fruit with rather long spreading hairs; those on the beak gland-tipped. Leaves rather firm, deep green. Whole plant often tinged with red, clothed with short rather stiff hairs.

Jagged-leaved Crane's Bill.

French, *Géranium Découpé.* German, *Schlitzblättriger Kranichschnabel.*

SPECIES XI.—GERANIUM COLUMBINUM. *Linn.*

PLATE CCCIII.

Reich. Ic. Fl. Germ. et Helv. Vol. V. *Geran.* Tab. CLXXXIX. Fig. 4875.

Tap-root annual or biennial. Stems ascending or decumbent, slightly dichotomously branched, sparingly hairy or sub-glabrous. Radical leaves stalked, angulated-roundish, 5- to 7-partite, or very deeply 5- to 7-cleft, with the segments not contiguous, rhomboidal in outline, deeply pinnatifid with the lobes strap-shaped and the lower ones often again pinnatifid; stem leaves similar to the radical ones, but with the lobes of the segments longer and narrower, and generally simple; uppermost leaves with the segments deeply 3-cleft with the lobes very narrow. Flowers few, on solitary axillary peduncles. Peduncles 2-flowered, equalling or exceeding the leaves from which they spring, rarely from the forks of the stem. Bracts linear-acuminate. Sepals triangular-ovate, sub-cordate at the base, awned, with the margins slightly recurved. Petals equalling the sepals, wedgeshaped-obovate, truncate or slightly notched at the apex. Filaments slightly ciliated below. Carpels smooth (not transversely wrinkled), keeled on the back, glabrous. Seeds pitted.

In thickets, pastures, and waste places. Rather rare, except in chalky districts, though found in most of the English counties. In Scotland it occurs only on the débris of trap rocks: near Dumbarton, in the Glasgow district; Dalmahoy Hill, Edinburgh; North Queensferry and Orrock Hill, Fifeshire; and in Forfarshire.

England, Scotland, Ireland. Annual or Biennial.
Spring to Autumn.

Much like G. dissectum, but more glabrous and slender, with the leaves on longer stalks, more decompoundly partite, more flaccid in texture. The flowers are much fewer, larger, with the petals purplish-rose, less spreading and much less deeply notched at the apex. The sepals twice as long as those of G. dissectum, and broader

at the base, enlarged and pyramidal in fruit from their recurved margins forming angles. Carpels with few or no hairs and a distinct keel.

Long-stalked Crane's Bill.

French, *Géranium Colombin.* German, *Trauben Kranichschnabel.*

Section II.—ROBERTIANUM. *Picard.*

Calyx erect in flower, pyramidal in fruit. Claw of the petal as long as or longer than the lamina, which is rounded at the apex. Carpels breaking away from their beaks when ripe.

SPECIES XII.—GERANIUM LUCIDUM. *Linn.*

PLATE CCCIV.

Reich. Ic. Fl. Germ. et Helv. Vol. V. *Geran.* Tab. CLXXXVII. Fig. 4872.

Tap-root annual or biennial. Stems ascending or decumbent, slightly dichotomously branched, glabrous. Radical leaves soon withering, stalked, roundish-reniform, 5- or 7-cleft with the segments contiguous, obovate-truncate, 3-lobed with the lobes crenate, slightly apiculate; stem leaves pentagonal, divided like the root leaves, but with the segments narrower; uppermost leaves angulated-reniform, more deeply divided; all shining and nearly glabrous. Flowers rather numerous, in dichotomous cymes. Peduncles in the forks of the stem and axils of the upper leaves, 2-flowered. Bracts lanceolate. Calyx 5-angled, with the angles winged. Sepals without hairs, unequal; the two outer ones ovate-accuminate, shortly awned, with the midrib prominent and the two lateral ribs winged; the third exterior, with midrib permanent, and one lateral rib winged; the two inner ones lanceolate, obtuse and shortly-awned, membranous, with a green keel and no lateral wings. Petals longer than the sepals, with slender connivent claws and spreading oblong-oval laminæ. Carpels reticulated and keeled on the back, obliquely wrinkled on the sides; breaking away entirely from their beaks. Seeds smooth.

In woods and shady places, preferring to grow on rocky débris and wall-tops. Rather sparingly but generally distributed.

England, Scotland, Ireland. Annual or Biennial. Spring to Autumn.

Stems numerous, decumbent at the base, nearly simple or once or twice forked. Radical leaves 1 to 2 inches across, on stalks 3 to 6 inches long, soon withering; stem leaves all opposite, the lower

ones on rather long stalks, the upper ones on much shorter stalks. Peduncles equalling or exceeding the leaves, longer than the pedicels, with a strip of very short hairs. Flowers $\frac{1}{4}$ to $\frac{3}{8}$ inch across, rose-colour. Calyx minutely glandular, ovate-pyramidal, transversely wrinkled, with 5 prominent angles and 5 intermediate ridges, the latter formed by the midribs of the sepals. Fruit, including the beak, $\frac{5}{8}$ to $\frac{3}{4}$ inch long. Beak hispid towards the apex. Carpels separating from their beaks when ripe and falling away, fawn-coloured, deeply reticulated, with raised lines passing into faint transverse wrinkles towards the inner edges, glabrous or slightly hairy towards the apex. Whole plant rather succulent, frequently tinged with bright red. Stems glabrous or with a longitudinal strip clothed with short hairs towards the top. Leaves shining, glabrous, rarely with a few short hairs.

Shining Crane's Bill.

French, *Géranium Luisant.* German, *Glänzender Kranichschnabel.*

SPECIES XIII.—GERANIUM ROBERTIANUM. *Linn.*

PLATES CCCV. CCCVI.

Reich. Ic. Fl. Germ. et Helv. Vol. V. *Geran.* Tab. CLXXXVII. Fig. 4871.

Tap-root annual or biennial. Stems ascending or decumbent, dichotomously branched, slightly hairy or glabrous. Radical leaves soon withering, stalked, pentagonal-5-lobed in outline, with 3-stalked divisions; divisions rhomboidal-ovate in outline; the lateral ones generally 2-partite; all bi-pinnatifid with the ultimate lobes not much longer than broad, apiculate, slightly hairy or almost glabrous. Stem leaves similar to the radical ones, but larger and with broader segments. Flowers rather numerous, in dichotomous cymes. Peduncles in the forks of the stem and in the axils of the upper leaves 2-flowered. Bracts ovate. Calyx 10-angled, with the angles not winged. Sepals hairy or sub-glabrous; the two outer 3-nerved; the third outer one 2-nerved, acuminate at the apex and awned; the two inner membranous, with only the mid-nerve prominent, truncate-emarginate at the apex and awned. Petals longer than the sepals, with slender connivent claws and spreading oblong-oval laminæ. Carpels reticulated and keeled on the back, obliquely wrinkled on the sides, breaking away from their beaks, but remaining attached to them by long silky hairs. Seeds smooth.

Var. *α, genuinum.*

G. Robertianum, *Jord. Bor.* Fl. du Centre de la Fr. ed. iii. Vol. II. p. 131.

PLATE CCCV.

Plant glandular-hairy. Sepals with gland-tipped persistent

hairs. Lamina of the petal as long as or a little longer than the claw. Carpels with deciduous hairs, reticulated.

Var. β, *modestum.*

G. modestum, *Jord.* Cat. Gr. Jard. Gren. 1849, p. 16 ? *Boreau*, Fl. du Centre de la Fr. ed. iii. Vol. II. p. 131.
G. Raii, *Lindley* ? Syn. Brit. Fl. p. 57.
G. Robertianum, β maritimum, *Bab.* ? Man. Brit. Bot. ed. v. p. 66.

Sub-glabrous, with the pedicels and calices glandular-pubescent; the gland-tipped hairs intermixed with longer woolly ones. Lamina of the petal shorter than the claw. Carpels glabrous, sparingly wrinkled with transverse oblique-branched lines.

Var. γ, *purpureum.*

PLATE CCCVI.

G. purpureum, *Vill. Forst.* in Eng. Bot. Sup. No. 2648. *Lowe*, Man. Fl. Mad. p. 85 ?
G. minutiflorum, *Jord.* Pug. Pl. Nov. p. 39.

Sub-glabrous, with the pedicels and sepals rather sparingly glandular-pubescent. Lamina of the petals shorter than the claw. Carpels glabrous, reticulated on the back, the sides wrinkled with oblique ridges. Leaves more finely divided, and with the lobes narrower and more diverging than in varieties α and β.

Var. α in bushy places, shady hedgebanks, and waste stony places. Common and generally distributed. Var. β I have only gathered on the shingly beach at Grand Cobo, Guernsey; but I also possess a specimen from Torquay, gathered by Mr. C. Eyre Parker. Var. γ is common on shingle in the South of England; I have found it near Kingsdown, Kent, and at Shoreham, in Sussex. The "English Botany" figure was drawn from a plant gathered at Stokes Bay, Hampshire.

England, Scotland, Ireland. Annual or Biennial. Spring to Autumn.

A diffusely branched plant. Var. α with the stems 1 to 2 feet long. Leaves 1½ to 3 inches across, with the main segments separated by an obtuse-angled sinus. Peduncles equalling or exceeding the leaves. Flowers ½ to ¾ inch across, reddish, having 3 white stripes on each petal alternating with dark rose-coloured stripes. Carpels brown, attached to their beaks by long silky hairs. Whole plant hairy; the hairs on the stem, petioles, peduncles and sepals articulated, and intermixed with shorter gland-tipped ones.

Var. β, which I can identify with G. modestum of Jordan (having an authentic specimen of that plant), is much more glabrous, tinged with deeper red, but the calyx has the long woolly

articulated hairs of G. Robertianum, var. α, though longer and more abundant than in that form. The carpels, however, are glabrous, and with the wrinkles forming scarcely any meshes; the petals are smaller, and of a deeper rose-colour.*

Var. γ is a smaller and more branched plant, with the deep purplish-red of G. lucidum, and glabrous except a few short glandular hairs on the sepals, and in a strip on the peduncles and pedicels. The carpels resemble those of var. β, but are more closely wrinkled, and have the wrinkles at the back anastomosing so as to form a few meshes. This is certainly the plant represented in Forster's "English Botany" Supplement as G. purpureum; it is also that represented as G. purpureum (Vill.) in Reich, l. c. fig. 4871B; and it is apparently identical with G. minutiflorum, of which I possess authenticated specimens, though these are less branched than is usually the case in the British plant.

All the forms have more or less a peculiar fetid odour, which is however strongest in var. α.

Herb Robert.

French, *Géranium Herbe à Robert.* German, *Ruprechtskraut.*

The common name of this pretty plant is said to have originated in its being used to cure a disease called in Germany "Ruprechts Plage," very probably in allusion to Robert Duke of Normandy, for whom the celebrated medical work of the Middle Ages, the "Ortus Sanitatis," was written. The name occurs in a MS. vocabulary of the thirteenth century. In former times this herb had a considerable medical reputation, and was used as a vulnerary and abstergent. It possesses, in common with its whole family, slightly astringent qualities, and, according to the doctrine of signatures, Sir John Hill informs us that its power to arrest bleeding is indicated by the beautiful red hue assumed by the fading leaves. In Wales it is still administered in medicine, and our never-failing friend Gerarde extols it as an excellent "stauncher of blood."

GENUS II.—ERODIUM. *Linn.*

Flowers nearly regular. Sepals 5, persistent, free, imbricated; the upper one not spurred. Petals 5. Glands 5, alternate with the petals. Stamens 10; the 5 exterior ones without anthers, so that the anthers are only 5 in number. Capsule consisting of 5 separable cocca with long beaks, which are usually clothed with long hairs on the inner face. Axis forming a central column, from which the beaks of the different carpels separate and twist spirally.

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* As Dr. Lindley speaks of his G. Raii having the calyx shaggy, I suppose it must be referred to var. β instead of var. γ; and perhaps this may be Professor Babington's G. maritimum, though I have seen no plant which agrees with his description of the fruit being wrinkled only at the top.

Annual or perennial herbs with the habit of Geranium, but with the leaves most commonly pinnately veined and pinnately divided. Peduncles commonly bearing a number of flowers; beaks of carpels twisting in their lower portion like a corkscrew, the apical portion remaining untwisted.

The generic name of these plants comes from ερωδιος (*erodios*), a heron, from the form of the carpels resembling the head and beak of that bird.

SPECIES I.—ERODIUM CICUTARIUM. *L'Hérit.*

PLATE CCCVII.

Reich. Ic. Fl. Germ. et Helv. Vol. V. *Geran.* Tab. CLXXXIII. Fig. 4864.

Leaves all pinnate. Leaflets sessile or sub-sessile, ovate or oblong, deeply pinnatifid with the segments entire or with 1 or 2 projecting teeth near the apex. Sepals ovate or lanceolate, acuminate or cuspidate. Peduncles 2- to 8-flowered. Bracts at the base of the pedicels ovate-cuspidate. Petals as long as or longer than the sepals. Filaments of the fertile stamens tapering gradually from the base to the apex, linear-lanceolate, not toothed; filaments of the sterile stamens linear-lanceolate. Carpels hairy, with a circular depression on each side at the apex; the depression without glands, surrounded by a raised margin, beyond which there is a shallow concentric curved furrow on the basal side.

Var. α, *vulgatum.*

Stems decumbent or prostrate. Stem leaves with the lobes of the pinnæ short, oblong or obovate, not tapering gradually to the apex which is scarcely acute. Flowers few. Petals equalling or slightly exceeding the sepals, which are clothed with more or less spreading hairs often glandular. Plant more or less hairy, generally with many of the hairs gland-tipped.

Var. β, *chærophyllum. D.C.*

Stems ascending or decumbent. Stem leaves with the lobes of the pinnæ oblong or lanceolate, gradually tapering to the acute apex. Flowers more numerous than in var. α. Petals twice as long as the sepals, which are clothed with adpressed strigose hairs not tipped with glands. Plant more or less hairy, the hairs mostly without glands.

In waste sandy places and hedgebanks; var. β chiefly in culti-

vated fields. Common in England; more rare in Scotland, though generally distributed.

England, Scotland, Ireland. Annual or Biennial. Spring to Autumn.

Root a thick fleshy tapering tap-root, from the crown of which a rosette of radical leaves is produced in a circle in var. α, withering as the stems lengthen. Stems fleshy, at first very short, so that the flowers appear to spring from the rosette of the root leaves, but elongating as the season advances until they become from 6 inches to 2 feet long. Radical leaves 2 inches to 1 foot long, oblong in outline; the pinnæ rather distant below, approximate towards the apex, where a few of the terminal ones are united at the base. Stem leaves alternate, often with smaller fasciculate ones opposite to them. Peduncles opposite the leaves, and generally exceeding them. Pedicels in an umbel, shorter than the peduncle, surrounded by an involucre of scarious pointed bracts. Flowers purplish-rose or white, $\frac{3}{8}$ to $\frac{1}{2}$ inch across. Sepals oblong, acute, slightly awned, the awn terminated by 1 or 2 white bristles. Petals oval-oblong, contracted into a very short claw, slightly unequal, two of them often with a spot at the base. Filaments purplish, persistent. The five fertile ones longer than the others. Fruit $1\frac{1}{4}$ to $1\frac{1}{2}$ inch long, of which the carpel is nearly $\frac{1}{4}$ inch, fusiform-clavate, with short stiff hairs and a rather shallow circular depression on each side of the base of the beak, the sides covered with short stiff adpressed hairs. Beak twisting spirally in the half next the carpel, clothed with rather long stiff hairs on the inner side. Seeds cylindrical-fusiform, dark brown, very finely shagreened, dull. Plant more or less glandular-pubescent with longer spreading articulated hairs.

Var. β has fewer root leaves and more slender divisions to the stem leaves, more erect stems, and more numerous and larger flowers; but the transition between the two seems to be gradual.

Mons. Jordan divides E. cicutarium into a number of species. I can, however, make out nothing from his descriptions; and in the absence of the authentic specimens, I am unable to say which of the various forms he notices occur in this country. The only authentic specimens I possess are of his E. commixtum, which I refer to var. α. Mr. Baker has sent me a specimen of E. pilosum (Jord.), named by Boreau, which appears to me also referable to var. α, though smaller and less glandular.

Common Stork's Bill.

French, *Érodie à Feuilles de Ciguë.* German, *Schierlingsblättriger Reiherschnabel.*

Several species of Erodium have been extolled as astringents, and used in country pharmacy. The curious appearance and spiral nature of the covering of the seed in this species is well worth observation. This singular spiral spring to which the seeds

are attached has the power of contracting and dilating according to the weather, be it wet or dry; thus the seed to which this little appendage is adherent is kept constantly moving until it is either destroyed by the vicissitudes of weather, or inserted into some tiny nook or crevice of earth, where it germinates and becomes a fresh plant.

SPECIES II.—ERODIUM MOSCHATUM. *L'Hérit.*

PLATE CCCVIII.

Reich. Ic. Fl. Germ. et Helv. Vol. V. *Geran.* Tab. CLXXXIV. Fig. 4807.

Leaves all pinnate, with the pinnæ sub-sessile, ovate, irregularly cut and coarsely serrate at the margins. Stipules broadly ovate, obtuse, sometimes apiculate. Peduncles 3- to 10-flowered. Bracts at the base of the pedicels ovate, rounded, and sometimes apiculate at the apex. Petals about as long as the sepals. Filaments of the fertile stamens winged on each side for about half their length from the base, the enlarged portion terminating in a tooth on each side; sterile stamens linear-lanceolate. Carpels hairy, with a deep circular depression at the apex on each side, the depression with a few glands and surrounded by a raised margin, beyond which there is a very deep curved concentric furrow on the basal side.

In waste places and by roadsides. Rare and probably only truly wild in the South-West of England and in Ireland, though it has been recorded as far North as near Scarborough, Yorkshire, and in Anglesea. I have myself gathered it only in the Channel Islands, where is abundant.

England, Ireland. Annual or Biennial. Spring to Autumn.

E. moschatum bears considerable resemblance to E. cicutarium, but is a larger and coarser plant, with the stems much thicker, the leaves with fewer and larger leaflets much less deeply divided; the flowers smaller, pale purplish-rose or nearly white; the stipules very much larger and not at all acuminate or cuspidate at the apex; the sepals more elliptical, terminating in a short awn, which has rarely white hairs at the apex; the fruit larger, 1½ to 2 inches long; the seeds with a deeper depression and a much deeper furrow, both of which have a few small scattered sessile glands; the hairs shorter and more glandular. The strongly toothed base of the fertile stamens affords an unmistakable character.

Musk Stork's Bill.

French, *Érodie Musquée.* German, *Bisamduftender Reiherschnabel.*

SPECIES III.—ERODIUM MARITIMUM. *Sm.*

PLATE CCCIX.

Reich. Ic. Fl. Germ. et Helv. Vol. V. *Geran.* Tab. CLXXXVI. Fig. 4870.

Leaves ovate-oblong, sub-cordate at the base, pinnatifidly lobed with the lobes again crenately lobed. Stipules lanceolate-acuminate. Peduncles 1- to 3-flowered. Bracts ovate-lanceolate, acuminate. Petals a little shorter than the sepals. Filaments linear-lanceolate, the fertile ones not winged or toothed. Carpels hairy, with a deep semicircular-oval depression on each side at the apex; the depression surrounded by a raised margin, on the lower side of which there is a nearly straight deep transverse furrow.

On sandy and gravelly sea-coasts in the West of England, from the Land's End in Cornwall to the Mull of Galloway in Wigtonshire. On the South coast it occurs in the Isle of Wight, and was formerly found in Sussex, though in that county the station for it is now lost. It is also said to be found near Sherwood Forest, in Nottinghamshire.

England, Scotland, Ireland. Annual or Biennial.
Spring to Autumn.

This plant has much the habit of the two last species, but is a smaller and more delicate plant the root leaves being $1\frac{1}{2}$ to 4 inches long including the leafstalk, the lamina being only from $\frac{1}{2}$ to 1 inch long; the latter, not being divided down to the midrib so as to make the leaf pinnate, is of itself sufficient to distinguish this from the other British species. The peduncles have usually only a single flower little more than $\frac{1}{8}$ inch in diameter, very pale purplish-rose. The sepals are broader and more oval; the capsule shorter, not above $\frac{1}{2}$ inch long; and the depression at the top of the carpels has the border next the base nearly straight, instead of being curved so as to form a complete circle as in both the preceding species.

Sea Stork's Bill.

French, *Érodie Maritime.*

EXCLUDED SPECIES.

GERANIUM STRIATUM. *Linn.*

This plant, the "Painted Lady" or "pencilled" Geranium of gardens, is often cultivated, and has escaped or been planted in

various localities, as in Aske Woods, Yorkshire; near Penzance, Cornwall; Isle of Jersey, etc.; but seems scarcely sufficiently naturalized to find a place in our Flora. It cannot well be mistaken for any of the other species. It resembles G. nodosum, but has the stem hairy and the flowers white with purple veins.

Sub-Order II.—OXALIDEÆ.

Flowers regular. Sepals herbaceous, persistent, generally slightly united but none of them spurred at the base. Petals caducous, free or slightly united at the base. Stamens 10 (rarely 15) all antheriferous; filaments frequently united into a short ring at the base. Torus not produced beyond the insertion of the uppermost ovules. Fruit of 5 carpels completely united together, without a distinct beak, 5-celled. Cells splitting down the back, each with several or numerous ovules, rarely indehiscent. Seeds generally enclosed in a succulent arillus, which is ruptured at maturity, and by its elasticity expels the seeds. Albumen fleshy. Radicle straight.

GENUS III.—OXALIS. *Linn.*

Flowers regular. Sepals 5, persistent, free, imbricated, the upper one not spurred. Petals 5. Stamens 10, all with anthers; the 5 opposite the petals the longest. Capsule herbaceous-membranous, oblong or ovoid-prismatical, pyramidal towards the apex, with 5 angles. Seeds numerous, compressed, striate.

Herbs (or more rarely undershrubs), sometimes with tuberous or elongate fleshy rootstocks, and frequently stemless. Leaves alternate, most commonly trifoliate and resembling those of clover, but sometimes quadrifoliate or pinnate. Peduncles axillary or radical, generally with the flowers cymose or umbellate, more rarely solitary. Flowers yellow, rose-colour, purple, or white, sometimes dimorphous, with one of the forms having the petals extremely small.

The generic name of Oxalis comes from ὀξυς (*oxys*), acid, the leaves having an acid taste.

SPECIES I.—OXALIS ACETOSELLA. *Linn.*

PLATE CCCX.

Reich. Ic. Fl. Germ. et Helv. Vol. V. *Oxal.* Tab. CXCIX. Fig. 4898.

Rootstock horizontal, creeping, slender, with imbricated fleshy tooth-like scales. Stem none. Leaves all radical, trifoliate. Peduncles radical, one-flowered. Bracts ovate. Peduncles and pedicels erect in fruit. Petals three or four times as long as the calyx. Capsule prismatic-ovoid, pyramidal at the apex. Seeds about 3 in each cell, longitudinally ribbed.

In damp woods, hedgerows, and shady places. Common, and generally distributed.

England, Scotland, Ireland. Perennial. Spring.

Rootstock slender, branched, creeping, scarcely buried, clothed at intervals with the scale-like persistent enlarged bases of the leaf-stalks, which are covered with long somewhat wiry hairs. Leaves on stalks 2 to 8 inches long; the lamina 1 to 2 inches across, consisting of 3 inversely deltoid or transversely ovoid-deltoid sub-sessile leaflets, rounded and more or less deeply emarginate or obcordate at the apex; the three leaflets flat during the day, but each one folding together inwards and hanging down at night. Peduncles from the axils of the leaves, 2 to 8 inches high including the pedicel, the commencement of which is only indicated by a pair of bracts. Flower $\frac{3}{4}$ inch across, in form between funnel-shaped and bell-shaped, white, veined, more rarely pink or purple. Sepals broadly elliptical, obtuse. Petals very delicate, obovate, erose at the apex, cohering by a projection on each side immediately above the claw. Stamens 5 long and 5 short, with the filaments united at the base. Capsule erect, whitish, mottled with brownish-purple, twice or thrice as long as the sepals, 5-angled in section, with each of the cells containing 3 (or more rarely 2) seeds. Seeds brownish, oval-obovate, flat, inclosed in a white fleshy arillus, by the contraction of which they are expelled. Plant with scattered hairs, succulent with acid juice. Leaves yellowish-green, generally purple beneath.

Wood Sorrel.

French, *Oxalide Oseille.* German, *Gemeiner Sauerklee.*

There are but few walks or shady woods where in the early spring this pretty little plant may not be found. The tiny white flowers with the delicate purple veins are called by the Welsh "fairy bells," and are believed to ring the merry peals which call the elves to "moonlight dance and revelry." There seems to surround this little plant an atmosphere of mystery and legendary lore. It is said to be the true shamrock of Ireland, and many and warm disputes have there been to determine whether this name really belongs to the trefoil white clover or to the three-leaved Wood Sorrel.

The great feast of St. Patrick, the tutelar saint of Ireland, is in the early spring, when clover would certainly not be in perfection, but when our tiny Oxalis would be in all its beauty. This circumstance inclines us to think that it was the little plant we have now before us that was honoured by the touch of St. Patrick when he drew from the triple leaflet the illustration he sought to give his simple hearers of the great doctrine of the Trinity or a triune nature. The term "shamrock" has possibly been applied to all three-leaved plants both in poetry and prose; but several passages we have seen appear to point especially to the Oxalis as the true and generally accepted shamrock. Piers, in speaking of the early spring-time in Ireland, says: "For then the milk becomes plenty, and butter and new cheese, and curds and shamrocks are the food of the meaner sort all this season." And Withers, in his "Abuses Stript and Whipt," written in 1613, says:—

> "And for my cloathing in a mantle goe,
> And feed on shamroots as the Irish doe."

Spenser, in his "View of the State of Ireland during a Famine," writes: "Out of every corner of the wods and glynnis they come creeping forth upon their hands, for their legs could not bear them; they looked like anatomies of death; they spoke like ghosts crying out of their graves; they did eat the dead carrions; and if they found a plot of watercresses or shamrocks they flocked as to a feast." These and many other quotations might be given as indicating that the Wood Sorrel was the original Irish shamrock; however, nowadays Irishmen are for the most part content to mount a sprig of the three-leaved clover (Trifolium repens) on St. Patrick's day; for the cultivation which has brought in the more useful plant has been in a great measure fatal to our poetical little Oxalis. Certain it is that this plant was held in mystic veneration by the Druids, by whom it was considered a symbol of some mysterious doctrine known only to the initiated. The legend of the magic influence of a four-leaved shamrock originated no doubt in the extreme rarity of this occurrence in the Oxalis. The clover is frequently found with four or even five leaflets, but the Oxalis rarely or never has more than three. Its triple leaflets are frequently to be found in the sculptured ornaments of old Gothic churches and ecclesiastical buildings. With all these mysterious surroundings, it would have been strange if our much-believing forefathers had not found some wonderful medical properties in so favoured a plant. To the monkish herbalists it was known under the name of "Hallelujah," which Gerarde accounts for thus: "The apothecaries and herbalists call it Alleluya and Panis Cuculi or Cuckowes Meat; because either the cuckoo feedeth thereon, or by reason when it springeth forth and floureth the Cuckou singeth most, at which time also Alleluya was wont to be sung in churches." It is thought to be that which Pliny (lib. xxvii. cap. 12) calleth Oxys, writing thus: "Oxys is three-leaved; it is good for a feeble stomack. Sorrell du Bois or Wood Sorrell stamped and used for greene sauce is good for them that have sicke and feeble stomackes, for it strengtheneth the stomacke, procureth appetite, and of all sauces Sorrell is the best, not only in virtue but also in the pleasantness of his taste. It is also a remedy against ulcers of the mouth, it quencheth thirst and cooleth mightily any hot pestilential fever, especially being made with a syrup of sugar."

Wood Sorrel was at one time the principal ingredient in the famous green sauce for fish, once so celebrated and still used on the Continent, though the Rumex acetosa generally takes its place. The leaves contain a large quantity of binoxalate of potash, which gives them an agreeable acid flavour. When the juice is evaporated, this salt is deposited in crystals, and so prepared was formerly sold as "salt of lemons" or "salts of sorrel," for

removing iron stains; but since the manufacture of oxalic acid from other sources it is seldom used. The leaves of the Wood Sorrel have been eaten in Ireland from time immemorial as a salad in the spring, and a decoction of these leaves in whey is used in the Hebrides for putrid fevers; infused in water they form an agreeable cooling drink in all febrile disorders, and a conserve made of the leaves beaten up with sugar is recommended for the same purpose. Beddoes and Withering recommended the plant, "wrapped in a cabbage-leaf and macerated in warm ashes until reduced to a pulp," as an application to scrofulous ulcers. These are, however, but household remedies, and we do not find that the virtues of the little plant are sufficient to secure for it a place in the "Materia Medica." The Wood Sorrel approaches the nearest of all our native plants to a sensitive plant, not only closing its petals and folding its bright green leaves at sunset and with every change of atmosphere, but even if the stem be rudely or repeatedly struck. In a flower-saucer or pan covered with a glass shade this pretty plant forms a charming object; and we have frequently seen it blossoming year after year in a Wardian case or under a hand-glass, covering the space given to it with its delicate white blossoms. An old Welsh proverb says:—

> "Three things let no one trust such as shall dislike them,—
> The scent of trefoils, the taste of milk, the song of birds."

SPECIES II.—OXALIS CORNICULATA. *Linn.*

PLATE CCCXI.

O. corniculata, *Linn.*; et O. villosa, *M. B.* *Reich.* Ic. Fl. Germ. et Helv. Vol. V. *Oxal.* Tab. CXCIX. Figs. 4896, 4897.

Annual or biennial, without stolons. Stems much branched, with the branches procumbent, rooting at the base. Leaves all on the stem, with oblong adnate stipules at the base. Lamina trifoliate. Peduncles axillary, 2- (rarely 3-) flowered. Bracts lanceolate-linear. Petals twice as long as the calyx. Fruit pedicels deflexed, hooked upwards at the apex, so that the capsule is nearly parallel to the peduncle. Capsule densely downy, cylindrical-prismatic, pyramidal at the apex; each cell with numerous transversely-ribbed seeds. Stem, peduncles, pedicels, sepals, leafstalks, and edges and midribs of the leaflets pubescent.

By roadsides and on banks and cultivated ground. Rare; probably only indigenous in Cornwall and Devonshire, if even there. It has, however, been reported from Dorsetshire, Isle of Wight, Middlesex, Gloucestershire, Lanarkshire, and Stirlingshire.

England, [Scotland]. Annual or Biennial. Spring to Autumn.

Stems numerous, diffusely branched, at first ascending, but at length quite procumbent and rooting at the base. Leaves alternate, or the upper ones imperfectly whorled, on peduncles 1 to 3

inches long, with the laminæ $\frac{3}{4}$ to 1 inch across; the leaflets similar to those of O. acetosella. Stipules $\frac{1}{8}$ inch long, adnate to the leafstalk abrupt at the apex, fringed with hairs. Peduncles when mature $1\frac{1}{2}$ to 3 inches long. Bracts 3 or 4, very narrow. Pedicels when in fruit equal to or a little shorter than the capsule. Flowers $\frac{3}{4}$ inch across, bright yellow. Sepals oval-lanceolate, with adpressed hairs. Petals oblong-oblanceolate. Capsule three to five times as long as the sepals, from $\frac{1}{2}$ to $\frac{3}{4}$ inch long, with 5 prominent angles. Seeds reddish-brown, obovate-oval, flat, with very deep transverse ridges. Plant light, rather greyish-green, more or less thickly pubescent except the leaves which are generally glabrous when full grown, but when young covered with a tangled web of short white hairs.

Procumbent Yellow Wood Sorrel.

French, *Oxalide Cornue.* German, *Gehörnter Sauerklee.*

SPECIES III.—OXALIS STRICTA. *Linn.*

PLATE CCCXII.

Reich. Ic. Fl. Germ. et Helv. Vol. V. *Oxal.* Tab. CXCIX. Fig. 4895.

O. europea, *Jord.* in *Billot's* Arch. de la Fl. de Fr. et d'Allem. p. 309; and *Billot,* Annot. p. 20.

Plant emitting subterraneous stolons. Stem erect, slightly branched at the base; stem and branches erect or ascending. Leaves all on the stem, with the footstalks slightly enlarged at the base, but without evident stipules; lamina trifoliate. Peduncles axillary, 2- to 8-flowered. Bracts lanceolate-linear. Petals twice as long as the calyx. Fruit pedicels erect or ascending. Capsule nearly glabrous, cylindrical-prismatic, pyramidal at the apex, each cell with numerous transversely-ribbed seeds. Stem, peduncles, pedicels, and leafstalks with a few distant hairs; sepals and laminæ of leaves quite glabrous.

In cultivated ground. Rather rare, and certainly introduced, but naturalized as a weed in gardens and fields at Penzance, Cornwall; near Bideford and Ilsington, Devon; Yarmouth, Isle of Wight; Cuckfield, Sussex; Congleton, Cheshire; Weybridge, Surrey; and several other counties in the South and West of England.

England. Annual or Perennial. Summer, Autumn.

Oxalis stricta closely resembles O. corniculata; but while the latter is truly annual, or when springing from seed late in the year in mild winters biennial, O. stricta is, properly speaking, a perennial, though in severe winters it is frequently killed off, so as

to be annual. It produces from the stem underneath the ground slender stolons which develope into new individuals in the season succeeding that in which they are produced. The stem is nearly upright, scarcely branched except from the base, 6 to 18 inches high, with the leaves crowded at intervals so as to form imperfect whorls, and the stipules are smaller and completely combined with the base of the leafstalk so that they appear to be absent. The peduncles are longer, usually with more than 2 flowers, which are in a small cyme at the apex, larger than in O. corniculata; and the pedicels after flowering merely diverge without being bent backwards as in that species. The sepals are glabrous, and the capsules have only a few scattered hairs instead of the dense covering of down which clothes those of the preceding plant.

In this species we have an example of an American plant becoming completely naturalized in Europe. In Britain it exists in many more places than O. corniculata, and when once introduced in any locality it appears to keep its ground; so that it seems fairly entitled to a place in our Flora.

Upright Yellow Wood Sorrel.

French, *Oxalide Raide.* German, *Steifer Sauerklee.*

The leaves of all the species of Oxalideæ are sensitive, and can be made to fold up by an external stimulus. This property is possessed in only a slight degree by the British species.

Sub-Order III.—BALSAMINEÆ.

Flowers irregular. Sepals 3, coloured, deciduous; the two anterior ones extremely small; the posterior one large (composed of 3 united ?), hooded and spurred at the base, petaloid. Petals 4 or 5, the two lateral ones frequently united. Stamens 5, with the filaments short and flattened; the anthers slightly cohering round the pistil. Fruit a 5-celled capsule (or 1-celled by the abortion of the dissepiments) splitting loculicidally into valves which roll up spirally, or an indehiscent berry. Seeds exalbuminous, with the embryo straight.

GENUS IV.—IMPATIENS. *Linn.*

Flowers irregular. Sepals 3, caducous, imbricated, coloured; the lateral ones very small or absent; the upper or inner one (which at last becomes the outer or lower, by its weight twisting the pedicel half round) very large, concave, with a straight or bent

spur at the base. Petals 5, the two lateral ones united together and appearing like a single petal with two unequal lobes; the one opposite the hooded sepal slightly concave. Glands none. Stamens 5, very short, with the anthers cohering. Capsule ovoid-fusiform or sub-cylindrical, with the valves separating from the column which bears the placenta and coiling spirally; or occasionally the central column is deciduous as well as the valves.

Herbs with thick succulent stems, or undershrubs, commonly glabrous. Leaves alternate, opposite or radical, without stipules, but often having glands at the base of the petiole, pinnately veined, serrate or dentate. Peduncles axillary, solitary, or several together, 1- or several-flowered. Flowers generally handsome, yellow, purple, rose-colour, or white.

If we compare the flower of Tropœolum with that of Impatiens, it will be seen that the spurred sepal of the latter answers to the spurred sepal plus the 2 lateral ones next it in the Indian Cress or Canary plant; and thus in Impatiens the odd sepal appears to be formed by the complete union of these three, which union takes place only partially in Tropœolum.

The name given to this genus of plants speaks for itself. It means "impatient," and refers to the great elasticity of the valves of the capsule, which throw out the seed with great force when touched.

SPECIES I.—IMPATIENS NOLI-ME-TANGERE. *Linn.*

PLATE CCCXIII.

Reich. Ic. Fl. Germ. et Helv. Vol. V. *Oxal.* Tab. CXCVIII*b*. Fig. 4483.

Leaves oval-elliptical, not acuminated at the apex, serrated with rather large unequal shallow teeth. Stipules none. Peduncles 3- to 6-flowered. Flowers drooping. Spurred sepal elongate-conical, nearly thrice as long as broad, tapering gradually to about one-fourth from the apex, where it is hooked round, but the hook not applied to the side of the hood, nor emarginate at the apex.

In moist shady places, probably wild in some of the stations recorded for it. In Montgomery, North Wales; and Heywood, Lancashire; and Stockgill, and various places about Winandermere, Westmoreland. It has, however, been found in many other places, but doubtless escaped from cultivation.

England, [Scotland]. Annual. Summer and Autumn.

Stem succulent, erect, branched, 1 to 2 feet high, enlarged at the nodes. Leaves alternate, stalked, with the lamina 3 or 4 inches

long, slightly decurrent upon the petiole, rather obtuse but apiculate at the apex; teeth rather few, large, apiculate, some of those towards the base often reduced to soft bristles tipped with glands. Peduncles axillary, terminating in a short raceme of about 6 flowers, of which one or two have petals, the others have the petals more or less abortive. Pedicels with bracts a little above their junction with the peduncle. Flowers $1\frac{1}{4}$ inch long to the bend of the spur, by $1\frac{1}{4}$ inch across the lateral petals, pale yellow, with the inner side of the spurred sepal on the base and the inner margin of the lateral petals dotted with red; spurred sepal the shape of an extinguisher, with the mouth oblique, bent over outwards for the last quarter of its length, the extreme tip curved in the contrary way like a shepherd's crook. Capsule 1 to $1\frac{1}{2}$ inch long, irregularly prismatic-cylindrical, somewhat beaded, splitting when ripe into 5 valves which coil up spirally. Plant light green, quite glabrous.

Yellow Balsam.

French, *Impatiente-n'y-Touchez-pas, Balsamine Jaune.*
German, *Gemeines Springkraut.*

The common English names of this plant, "Quick-in-the-Hand" and "Touch-me-not," well express its nature and its extreme irritability, which it has in common with the whole of the Balsam tribe of plants. The whole plant is very acrid, and few animals but goats will eat it. Notwithstanding this, it has been administered in medicine. Boerhaave considered it as poisonous.

SPECIES II.—IMPATIENS FULVA. *Nuttall.*

PLATE CCCXIV.

Leaves ovate or oval-elliptical, not acuminated at the apex, serrated with rather large unequal very shallow teeth. Stipules none. Peduncles 1- to 4-flowered. Flowers drooping; the spurred sepal twice as long as broad, conical, suddenly narrowed about one-fourth from the apex, where it becomes cylindrical, and is hooked round with the hook applied to the side of the hood and notched at the apex.

In moist places by the banks of rivers. An American plant, thoroughly naturalized in Surrey, along the Wey, the Thames, the Tillingbourne, the Mole, and the Basingstoke Canal.

England. Annual. Summer and Autumn.

Extremely similar to T. Noli-me-tangere, but the leaves are less deeply serrated, the flowers fewer, orange-coloured with more numerous red dots, shorter (about 1 inch long), with the hooded sepal not tapering gradually to the extremity of the spur, but suddenly contracted at the point where it is bent round, where

the curvature is so sharp that it brings the extremity of the spur against the side of the hood; the extreme apex also is notched. The whole plant is of a duller green, and frequently tinged with brownish red. The stem is usually taller, 1 to 4 feet high, thicker and more succulent.

Orange Balsam.

SPECIES III.—IMPATIENS PARVIFLORA. *D.C.*

PLATE CCCXV.

Leaves oval, abruptly acuminate, or shortly cuspidate at the apex, closely serrated with small equal rather shallow teeth. Stipules small. Peduncles many-flowered. Flowers sub-erect. The spurred sepal very little longer than broad, elongate-conical, suddenly narrowed a little above the enlarged base; spur straight to the apex which is entire.

In waste places and cultivated ground. A native of Siberia, but tolerably well naturalized. Frequent about London, as at Battersea, Wandsworth, and Wimbledon; also in Cambridgeshire, Lancashire, and other places.

[England]. Annual. Summer and Autumn.

Stem 8 to 18 inches high, slightly branched. Lamina of the leaves 2 to 3 inches long, suddenly narrowed at the base, and decurrent on the petiole nearly to its base; the margins closely and evenly serrated; the serratures apiculate. Flowers in axillary panicles of from 3 to 12 flowers, which are about $\frac{1}{2}$ inch long, pale buff yellow slightly spotted with red in the inside. Capsule $\frac{1}{2}$ to $\frac{3}{4}$ inch long. The smaller flowers and straight spur, as well as the more evenly and finely serrated leaves terminating in an acuminate point, at once distinguish this from the two preceding species.

Small Balsam.

German, *Kleinblüthiges Springkraut.*

ORDER XXI.—ILICINEÆ.

Trees or shrubs, generally glabrous or evergreen, without glands and with watery juice. Leaves alternate, exstipulate, stalked, simple, leathery, generally entire. Inflorescence axillary and terminal, cymose, or more rarely with solitary or fascicled pedicels in the axils of the leaves. Flowers rather small, white, regular, perfect, poly-

gamo-dicœcious or unisexual. Calyx 3- to 6-partite, imbricated, generally persistent. Petals 4 or 5 (rarely more), free or united at the base, hypogynous, deciduous, imbricated. Stamens as many as the petals, free or slightly adhering to the petals. Filaments subulate. Anthers introrse. Disk none, or undistinguishable from its union with the ovary. Ovary free, 3-, 4-, 5-celled, rarely many-celled. Style none, absent or terminal. Placentæ at the apex of the cells. Ovules 1 or 2 in each cell. Fruit fleshy, with as many stones as there are cells in the ovary. Stones hard, 1-seeded. Seed with a membranaceous seed-coat. Albumen copious, fleshy. Embryo minute, in the apex of the albumen, straight, with the radicle superior.

GENUS I.—ILEX. *Linn.*

Flowers generally perfect. Calyx small, persistent, 4- (more rarely 5- or 6-) cleft. Corolla rotate, with as many oblong-obtuse segments as there are divisions of the calyx. Stamens as many as the lobes of the corolla, to the short tube of which they slightly adhere. Stigma sessile or sub-sessile. Fruit globose, drupaceous, with the fleshy portion rather dry, containing 4 to 8 bony pyrenes or stones, each of which contains a single seed.

Trees or shrubs with shining leathery entire (or more rarely spinous-dentate) leaves. Flowers small on axillary branched peduncles.

The name of this genus of plants is said to be derived from the Celtic word *ac*, a point, in reference to the prickly nature of the leaves of several species.

SPECIES I.—ILEX AQUIFOLIUM. *Linn.*

PLATE CCCXVI.

Leaves evergreen, leathery, shining, glabrous, elliptical-oval, acute or acuminate; those of the lower branches spinously serrate at the margins, those of the upper branches generally entire. Peduncles very short, axillary, bearing umbellate cymes of very numerous flowers.

England, Scotland, Ireland. Tree. Spring and early Summer.

A large shrub or small tree, about 20 feet high, though sometimes attaining 50 or 60 feet. Bark of the trunk and main branches smooth, ash-colour; that of the younger shoots angulated and green; the shoots of the year slightly downy. Leaves shortly stalked, 2 to 3 inches long, leathery, with a raised cartilaginous line round

the margin beneath: on young plants and the lower branches of old ones undulated at the edges, and with teeth terminated by strong spines, but those of the upper branches of old trees entire and flat. Inflorescence in axillary cymes with the pedicels (about $\frac{1}{4}$ inch long) longer than any of the primary divisions, so as to appear umbellate. Flowers $\frac{3}{8}$ inch across, white, tipped with dull red on the outside, frequently imperfectly dicœcious. Calyx small, slightly downy, with 4 ovate segments. Corolla with 4 obovate-oval concave spreading petals united at the base into a monopetalous corolla. Stamens 4, erect. Stigmas 4, sessile. Berries produced late in the autumn, about the size of a pea, bright scarlet, with dry mealy pulp enclosing 4 furrowed bony stones, each of which contains a single seed. Leaves dark green, paler beneath. In gardens a variety occurs with the foliage variegated with yellow.

The Holly.

French, *Houx Commun, Bois Franc.*
German, *Gemeine Stechpalme, Hülsenbaum, Christdorn.*

The Holly is known to every one as the most beautiful of our evergreen trees, and its bright green shining leaves and brilliant scarlet berries are associated in the minds of most Englishmen with Christmas rejoicings and merrymakings, with joyous faces and warm hearts, and with the observances of our great Christmas festival in our churches and our homes. The English Holly is in some parts of Britain called "Holm," or "Holm Oak," and has given the name to many villages in England near which it grows: thus Holmswood and Holmesdale in Surrey derive their names from the abundance of Holly which formerly grew there. We learn from Dr. Prior's work on the Popular Names of British Plants, that Holly, or Holm, on the Eastern border is called "Hollen," and that a change of the *n* into *m* formed "Holm." The Holly was used in very ancient times for the decoration of churches and places of worship. The custom of placing evergreens in sacred places was common long before the time of Christianity, and in the ancient Jewish feasts it was constantly observed. Those green boughs, however, spoken of in the old Scriptures were undoubtedly pine, fir, cedar, and sprigs of box. The Holly seems first to have been introduced for religious purposes by the early Christians at Rome, and was probably used for decorating the churches at Christmas, because the Holly was used in the great festival of the Saturnalia, which occurred about that period; and it was the policy of the early Fathers to assimilate as much as possible the festivals of the Pagans and the Christians in outward forms, to avoid shocking the prejudices of newly-made converts. Moreover, the Holly was considered by the ancient Romans as an emblem of peace and friendship, and was in perfection at the time of year when the Christian anniversary was celebrated of the coming of glad tidings of peace and good-will to man. The origin of this pleasant custom is, however, a little uncertain, for it may be traced in several directions. The Druids were accustomed to decorate their dwelling-places with branches of Holly during the winter, and it is said that the sacred mistletoe was often associated with the Holly in their religious observances. Dr. Chandler mentions that, during the time of these priests, houses were decorated with boughs of Holly, "that the sylvan spirits might repair thither and remain unnipped by frost and cold winds until a milder season had renewed the foliage of their darling abodes." In England perhaps the earliest record

of this custom is a carol in praise of the Holly, written in the time of Henry VI., and preserved in the Harleian MSS. :—

"Nay, Ivy, nay, it shall not be, I wys,
Let Holy hafe the maystry as the maner ys.
Holy stond in the halle, fayre to behold ;
Ivy stond without the dore, she ys full sore acold.

Holy & hys mery men they dawnsyn & they syng ;
Ivy & hur maydenys they wepyn & they wryng.
Ivy hath a lybe, she laghtit with the cold,
So mot they all leafe that wyth Ivy hold.

Holy hath berys as red as any rose,
They foster the hunters, kepe them from the doo ;
Ivy hath berys as black as any slo,
Ther com the oule & ete hym as she goo.

Holy hath byrdys, a ful fayre flok,—
The nyghtyngale, the poppyngy, the gayntyt lavyrok.
Good Ivy ! what byrdys ast thou ?
Non but the howlet, that how ! how !"

Stowe, in his "Survey of London," published in 1598, says that in his time every man's house, the parish churches, the corners of the streets, market crosses, etc., were decorated with holme, ivy, and bays at Christmas time. The disciples of Zoroaster believed that the sun never shadows the Holly tree, and the followers of that philosopher who still remain in Persia are said to throw water impregnated with Holly bark in the face of a child newly born. In the language of flowers Holly signifies foresight. Many curious verses, ancient and modern, relating to the use of Holly at Christmas may be found in Forster's "Perennial Calendar ;" and a poem by Southey alludes to the circumstance that the lower branches of the Holly tree within reach of cattle bear spinous, prickly leaves, whilst the upper ones, which need no defence, are soft and smooth :—

"Below, a circling fence, its leaves are seen
Wrinkled and keen.
No grazing cattle through their prickly round
Can reach to wound ;
But as they grow where nothing is to fear,
Smooth and unarmed the pointless leaves appear."

This tendency to produce prickly-pointed leaves renders the Holly peculiarly fit for hedges ; and when Dutch horticulture prevailed in England, such hedges were very frequent :—

"A hedge of Holly thieves that would invade,
Repulses like a growing palisade."

The ease with which the Holly can be kept trimmed, and its dense prickly foliage, render it the best possible natural fence. The celebrated Sir John Evelyn had such a hedge at Say's Court. It was four hundred feet long, nine feet high, and five feet broad. He planted it at the suggestion of Peter the Great, who resided at his house while he worked in the Deptford dockyard. This enthusiastic writer says, in his Diary : "Is there under heaven a more glorious and refreshing sight of the kind than such an

impregnable hedge, glittering with its armed and varnished leaves, the latter stud[illegible]; at orderly distances, blushing with their natural coral?"

It is said that hedges of Holly are now in existence that were planted more than two centuries ago, and are still in good order. In Loudon's exhaustive work on the Trees and Shrubs of Britain we have very curious details given of the age and size of Holly trees. He mentions one tree, on the authority of Pliny, that must have been upwards of 1,200 years old: also one tree standing at the time of Pliny, near the Vatican in Rome, on which was fixed a plate of brass with an inscription in Tuscan letters, showing that this tree was older than Rome itself, and must have stood there for about 800 years. Cole tells us in his "Paradise of Plants" that he knew a Holly tree of enormous size which grew in an orchard, and the owner, he says, "cut it down and caused it to be sawn into boards and made himself thereof a coffin, and if I mistake not left enough to make his wife one also. Both the parties were very corpulent, and therefore you may imagine the tree could not be small."

There are records of Holly trees of great size growing in some of the counties of England very recently. Near London, at Twickenham, is one forty feet high, and several elsewhere in height from thirty to fifty feet. These trees are, however, exceptions to the general appearance of Holly trees, which in England are usually not larger than bushes; and this circumstance may be accounted for by the fact that the wood is valuable and useful in the arts, and that therefore the trees have been felled before attaining any great size. At one time the Holly tree grew abundantly in Sherwood Forest and some of the extensive wilds of the Northern and Midland counties, and was probably the "greenwood tree" so often alluded to in the Robin Hood ballads and other records of English forest life. The great Hollies growing in the open glades of the woodlands, yielding good shelter all the year round, were favourite trysting places for the bold outlaws and rangers of the forest, and we may imagine Robin Hood and his man John arrayed in their suits of green as scarcely distinguishable from the bright green foliage of the tree which sheltered them. Until lately some fine Holly trees stood in the New Forest; but they have been recently cut down, and with them has been destroyed the abode of numberless thrushes and sweet song-birds that delighted in their thick shade.

To the turner the Holly wood is very valuable, as it is peculiarly even in the grain and very white. It is greatly used by the makers of the wood-work called "Tunbridge ware," and in all sorts of inlaid wood. One of the chief uses of the wood at present is as a substitute for ebony, when dyed black, in the handles of teapots, etc. The young shoots and branches are given to sheep and deer to eat during the winter in France, and the stronger straight shoots deprived of the bark are made into whip-handles and walking-sticks.

From the bark of the tree birdlime is prepared. The process adopted for its manufacture is somewhat tedious. The bark is stripped off in the summer and steeped in clean water; it is then boiled until it separates in layers, when the inner green portion is laid up in heaps until fermentation ensues; it will then become converted into a thick pasty mucilaginous mass, and is pounded into a paste, washed, and laid by again to ferment; it is then mixed with grease or oil, and is ready for use. Very little of this composition is made in England, but it is manufactured on a large scale in Italy and Turkey. Gardeners and birdcatchers are the only people who seem to have a use for it. The former employ it on the stems of trees and shrubs and on wires and lines stretched round flowerbeds, as a protection against hares and rabbits. The Holly is not without a reputation in medicine, and some years ago it was brought into notice as a tonic and febrifuge by

Dr. Rousseau, of Paris, who published a paper in the Transactions of the Medico-Botanical Society of London recommending the decoction or powder of Holly leaves and bark, as well as a new vegetable principle extracted therefrom, and called *ilicine*. It was said to be equally efficacious with quinine and Peruvian bark, and in some cases even superior. The silver medal was awarded to Dr. Rousseau for his communication by the Medico-Botanical Society, and he subsequently received a prize for the same subject from the French Academy. In the best chemical works we have consulted we find ilicine described as forming brownish-yellow crystals, very bitter and febrifuge. Much difference of opinion exists as to the efficacy of this agent in medicine, and it does not appear as one of the recognized remedies of the Pharmacopœia. Reil successfully employed the bark in cases where cinchona had failed, and Haller administered the juice of the leaves in jaundice with great advantage. The berries, however, possess totally different qualities to the bark, being violently emetic and purgative, and none but the thrush and blackbird can eat them with impunity.

The varieties of the Holly are very many, and it is one of the few exceptions to the rule that variegation of the leaf is accompanied with a ragged or unhealthy appearance. The markings of white or yellow in the leaves, the red, yellow, or nearly white colour of the fruit, form the most pleasing effect to the eye in the shrubbery, or when gathered and placed amidst other winter foliage. Thirty-one varieties of the common Holly are given in certain nurserymen's lists, and may be purchased as possessing distinctive features.

The Holly grows best in a gravelly or loamy soil, where there is good drainage, but where there is sufficient moisture about the roots, for in very dry localities it is stunted in its growth, but will live in almost any earth not saturated with moisture. It is rarely injured by severity of weather; for although it occasionally loses some of its leaves in intense frosts, it recovers perfectly in the spring. This hardiness, and the ease with which it is propagated and grown, renders the Holly one of our most valuable ornamental evergreens. It may be interesting to observe that a foreign species of this same genus (Ilex Paraguensis) gives the "mate" or Paraguay tea, so favourite a beverage in the countries where it grows. The Holly is the badge of the Highland clan of the Drummonds.

ORDER XXII.—CELASTRACEÆ.

Trees or shrubs, frequently spiny or climbing. Leaves opposite or alternate, often leathery, always simple and undivided, without glands. Stipules, if present, extremely caducous and generally minute. Inflorescence commonly cymose. Flowers small, greenish or white, regular, generally perfect. Calyx small, persistent, 4- or 5-cleft or -partite, imbricated. Petals as many as the sepals, sessile on the margin of the disk. Stamens 3 to 5 (very rarely 2 or 10), inserted on the disk, alternate with the petals, free. Anthers 2-lobed. Disk conspicuous, annular or lobed, rarely absent. Ovary sessile on the disk, to which it sometimes adheres by its base, 3- to 5- (rarely 1-) celled. Style short and thick, usually entire. Placentæ

towards the base of the cells, more rarely at the apex. Ovules 2 (more rarely 1) or numerous. Fruit of various forms (capsular, berry-like, drupaceous or samaroid). Seeds commonly erect or ascending, enclosed in an arillus (arillode), sometimes winged. Albumen fleshy or none. Embryo generally large, with flat foliaceous cotyledons; radicle near the hilum.

GENUS I.—EUONYMUS.

Calyx 4- or 5-cleft with the segments spreading or recurved. Petals 4 or 5, inserted at the base of the disk, spreading, entire, toothed or fimbriated. Stamens 4 or 5, inserted above the disk, rarely on its margin. Filaments short. Disk fleshy, 4- or 5-lobed. Capsule 3- to 5-celled, 3- to 5-lobed with the lobes angular or winged on the back, leathery, often rough; cells 1- or 2-seeded. Seed completely enclosed in an arillus when ripe.

Trees or shrubs, generally erect, with the branches commonly tetragonal. Leaves opposite, stalked, entire or serrate, glabrous. Stipules caducous. Peduncles axillary, cymose, generally few-flowered. Flowers small, generally greenish or purplish.

The name is supposed to come from *ευς* (*eus*), good, and *ονομα* (*onoma*), a name—well-named; though why such an appellation should be thought satisfactory we cannot tell.

SPECIES I.—EUONYMUS EUROPÆUS. *Linn.*

PLATE CCCXVII.

Reich. Ic. Fl. Germ. et Helv. Vol. VI. *Theac.* Tab. CCCIX. Fig. 5134.

Branches smooth, not verrucose, somewhat 4-sided. Leaves elliptical or oval-elliptical, acute or acuminate, indistinctly serrate. Peduncles compressed, axillary, 3- to 12-flowered. Flowers mostly tetramerous. Petals oblong. Fruit deeply lobed, the lobes rounded (not winged) on the back.

In woods, thickets, and hedges. Common in England, especially in chalky districts; rare in Scotland, but certainly wild on the coast of Kirkcudbright, and apparently so near St. Anthony's Well, Edinburgh, and also in Lanarkshire.

England, Scotland, Ireland. Tree. Early Summer.

A large shrub or small tree, usually 8 to 12 feet high, but sometimes as much as 20, with smooth greyish bark on the trunk; the younger branches with green bark. Leaves opposite, shortly

stalked, 1 to 4 inches long, rather firm, deciduous. Peduncles 1 to 2 inches long, bearing a dichotomous cyme of greenish-white flowers about $\frac{3}{8}$ inch across. Capsule generally 4-lobed, $\frac{3}{8}$ inch long, pale crimson when ripe, each of the 4 cells containing a seed which is covered by a bright reddish-orange arillus with an uneven surface.

The examples from the Great Ross, Kirkcudbright, have the leaves much larger and thinner than those of the common form, and belong to the variety macrophyllus of Schleicher, which I have not gathered anywhere else.

Spindle Tree.

It is also called in Ireland Pegwood, Gatteridge Tree, House-Berry, and Prickwood.

French, *Fusain d'Europe.* German, *Europäisches Pfaffenkäppchen.*

In France this shrub is also sometimes called "Bonnet du Prêtre" from the form of the seed-vessel, which opens as the seeds ripen; the covering of the seeds then exhibiting a beautiful example of the arillus.

The French word Fusain, by which it is commonly known, means a spindle or skewer, and alludes to the general use of the wood for making these instruments. The common English name, Prickwood or Prick-timber, refers to the same fact; and another popular name, Dogwood, is given to it, because a decoction of the leaves has been often used to wash dogs to free them from vermin. The hardness of the wood of this tree recommends it for many useful purposes besides the chief one of making skewers for butchers and others. In Germany the shoots are bored and made into pipe-stems. When burned in a close vessel they form an excellent charcoal for artists, better than the ordinary sort on account of the lines traced with it being easily effaced. The fruits of the tree have been employed by dyers, and they yield three distinct colours—green, yellow, and red. Being boiled with alum a green colour is produced, alone with water a yellow dye is formed, and the red capsules themselves give out a red colour. A decoction of the capsules in alkali is said to colour hair red, and the leaves dried and powdered had at one time a reputation for destroying vermin in children's heads. The fruit is believed to be purgative and emetic in a great degree, but it is eaten by the thrush and the blackbird, and probably by other birds. In plantations and in gardens these shrubs are very ornamental, and in the autumn "they spread by their numerous pendent capsules of a bright red colour or pure white, and their white and orange-coloured seeds, some rays of brilliance on the departing season, and recall the remembrance of the fine days of summer."

ORDER XXIII.—RHAMNACEÆ.

Trees or shrubs (very rarely herbs), erect or climbing, often thorny, very seldom with tendrils or glands. Leaves simple, generally stipulate, alternate or opposite, often leathery, frequently 3- or 5-nerved, entire or serrate. Stipules small, generally deciduous, sometimes represented by spines. Flowers commonly

perfect, small, green or yellowish, usually arranged in axillary cymes. Calyx often leathery, with an obconical turbinate urceolate or cylindrical tube, and a 4- or 5-lobed limb with the lobes triangular, erect or recurved, valvate. Petals very small, 4, 5, or none, inserted in the throat of the calyx, frequently hooded and emarginate. Stamens 4 or 5, inserted with the petals and opposite to them. Disk perigynous (rarely none), simple or lobed, smooth or tomentose. Ovary sessile, free or immersed in the disk, wholly superior or more or less adhering to the tube of the calyx, 3- (rarely 2- or 4-) celled. Style erect, generally short and thick. Placentæ near the base of the cells. Ovules 1 (or very rarely 2) in each cell, anatropous. Fruit free or more or less adhering to the tube of the calyx, generally 3-celled, various, often drupaceous. Seeds solitary, ovoid-compressed, often arillate at the base; seed-coat hard, leathery or membranaceous. Albumen fleshy, often scanty, but rarely absent. Embryo large, often greenish, with the radicle straight, inferior.

GENUS I.—RHAMNUS. *Linn.*

Flowers perfect or polygamo-dicecious. Calyx urceolate or bell-shaped, persistent, with 4 or 5 ovate-triangular erect or spreading lobes keeled within. Petals 4 or 5, very small, hooded or flat, inserted on the upper margin of the disk, sometimes absent. Disk clothing the tube of the calyx within. Fruit fleshy, round or oblong, containing 2 to 4 bony or cartilaginous pyrenes or stones which are nearly or quite indehiscent, and each of which contains a single seed.

Shrubs or trees, with alternate or sub-opposite leaves with small deciduous stipules. Flowers small, greenish, axillary, in fasciculate cymes or racemes.

According to the best authorities the name of this genus comes from ῥαζαμνος, a young branch or sprout, because divided into many branches; or we may further trace the derivation to the Celtic word *rum*, signifying a tuft of branches, which the Greeks have changed to ῥαμνος, and the Latins to *ramus*.

SPECIES I.—RHAMNUS CATHARTICUS. *Linn.*

PLATE CCCXVIII.

Stem erect. Old branches generally terminating in a spine. Leaves mostly opposite towards the base of the young shoots, elliptical or oval-elliptical, usually slightly acuminated towards the

apex, serrulate, with about 3 principal lateral veins on each side of the midrib, from which they spring at an extremely acute angle, and then describe a flat curve towards the apex of the leaf, where they again converge. Stipules subulate, much shorter than the petiole. Flowers dioecious, tetramerous. Style 2- to 5- (generally 4-) cleft. Berry usually 4-seeded.

In woods, copses, and hedgerows. Common in chalky districts, and rather sparingly distributed over England. In Scotland it does not apparently extend North of Dumfriesshire, except in localities where it has been planted.

England, Scotland, Ireland. Shrub. Spring and Summer.

A much-branched rigid shrub or small tree, usually about 6 feet high, but sometimes as much as 10 or 12. Bark smooth, blackish-brown, ash-coloured on the twigs. Leaves in fascicles on the branches of preceding years: on the young shoots of the year (which are often downy) they are rather distant, generally opposite towards the base of the shoot, but more generally alternate towards the apex, though this arrangement is by no means constant. Petiole much shorter than the lamina; the latter 1 to 2 inches long when full grown, varying from elliptical to oval, sometimes rounded, but more frequently shortly acuminated towards the apex; the lateral veins very prominent on the under side, the margin very finely and rather unequally serrate, most of the serratures tipped with black glands. Stipules deciduous. Flowers greenish-yellow, $\frac{1}{5}$ inch across, in the axils of the fascicles of leaves developed from the wood of the preceding year. Pedicels solitary or aggregated, longer than the calyx. Calyx tube of the male flowers bell-shaped, that of the female flowers cup-shaped; the segments lanceolate-acute, as long as the tube. Petals very small, linear, erect. Styles generally 4-cleft. Ovary rudimentary in the male flowers, and stamens in the female. Berries when ripe the size of a small pea, globose, depressed at the top, surrounded at the base by a portion of the calyx tube which remains, while the upper part and the segments fall off. Seeds generally 4, obscurely grooved on the back. Leaves dull green, slightly downy on the petioles and under side of the veins when young, glabrous when old.

Purging Buckthorn.

French, *Nerprun Purgatif.* German, *Gemeiner Kreuzdorn.*

This shrub yields a substance which has long found a place in the Materia Medica of our country, but on account of the violence of its action is now but seldom used. The berries are the official parts of the tree, and produce very powerful cathartic effects. In Lyte's translation of "Dodoen's Herbal" it is said, "they be not meete to be ministered but to young and lustie people of the countrie which doe set more store of their money than their lives." Twenty of the fresh berries were con-

sidered a dose, and a decoction of forty was sometimes given. The only form in which they are now administered by regular practitioners is as a syrup; but it is pleasant to be reminded by the very rare use of this active medicine that the days of violent remedies are gone, we hope, for ever, and that the intelligent practice of physic leans rather to the gentle assistance of Nature's own efforts than to the violent interference with her operations to which our forefathers were subject. The juice of the ripe berries of the Buckthorn mixed with alum or lime furnishes the sap-green so well known to water-colour painters. From the dried berries a series of rich but fugitive colours is obtained; they are sold under the name of "French berries," and are imported with those of R. infectorius from the Levant. Goats, sheep, and horses browse on this shrub; cows refuse it. The blossoms are very grateful to bees, and the leaves are eaten voraciously by goats.

SPECIES II.—RHAMNUS FRANGULA. *Linn.*

PLATE CCCXIX.

Frangula Alnus, *Mill.* *Garcke*, Fl. von Nord- und Mit.-Deutsch. ed. vi. p. 90.

Stem erect; branches without spines. Leaves all alternate, obovate-oval, usually slightly acuminate at the apex, entire; lateral veins 7 to 12 on each side of the midrib, from which they spring at an angle of about 45 degrees, running nearly straight to the margin, where they curve round and anastomose with the adjacent one on the apical side. Stipules subulate, much shorter than the petiole. Flowers perfect, pentamerous. Style undivided. Berry usually 2-seeded.

In woods, copses, and hedgerows. Not uncommon, and generally distributed in England. In Scotland it is only known in Ayrshire and Moray.

England, Scotland, Ireland. Shrub. Spring and Summer.

A shrub of about the same size as the last, but more slender and less rigid, with the leaves much more flaccid, 1½ to 3 inches long; the veins much more numerous and not describing a flat curve, nearly parallel to the midrib. Flowers about the same size as those of R. catharticus but with the calyx segments broader and shorter, the style undivided, and all perfect. Berry about the same size as the last-named species, reddish until it is quite ripe, when it turns black. Seeds much broader and flatter. Leaves yellowish green, glabrous except the petioles, which as well as the shoots of the year are covered with very short down.

The flowers in this species are produced not only from the wood of the preceding year but also on the shoots of the current year, which is very seldom the case with R. catharticus, though it sometimes takes place by the lengthening out of the branches on which the fascicles of leaves from the axils of which the flowers take their

rise; but generally these branches remain as short spurs terminated by spines, while those that produce elongated leafy shoots rarely bear any flowers.

Berry-bearing Alder, or Breaking Buckthorn.

French, *Nerprun Bourdaine.* German, *Faulbaum, Pulverholz.*

This species of the genus possesses the same qualities as the last one described. The bark and berries are occasionally used in veterinary practice. The bark and leaves yield a yellow dye much used in Russia; when mixed with salts of iron it turns black. The berries when unripe afford a good green colour, readily taken by woollen stuffs; when ripe they give various shades of blue and grey. The colouring matter in this, as in the Buckthorn, is principally a substance called "rhamnin." The wood of the Alder Buckthorn is too small to be of much value excepting for charcoal, for which purpose it is preferred by the gunpowder makers to almost any other tree, as it yields a very light and inflammable kind.

ORDER XXIV.—SAPINDACEÆ.

Trees (more rarely shrubs or undershrubs), sometimes climbing or twining, with watery sap which is very rarely bitter. Leaves frequently evergreen, alternate, often compound. Inflorescence various. Flowers generally small, greenish or white, regular or irregular, most commonly polygamo-dicœcious. Sepals 4 or 5 (rarely more or none), free or more or less united, often unequal, imbricated or rarely valvate. Petals 3 to 5 or none, equal or unequal, the posterior one frequently absent, often with a scale or tuft of hairs within, imbricated. Disk more or less conspicuous, more or less one-sided. Stamens 8 (rarely 5 or 10, very rarely fewer or more), commonly hypogynous and inserted within the disk. Filaments generally elongated. Ovary entire, lobed or partite, generally 3- (more rarely 1- to 4-) celled. Style simple or divided. Ovules usually 1 or 2 in each cell, ascending from an axial placenta. Funiculus often swollen. Fruit and seed various. Albumen generally none. Radicle short, inferior.

SUB-ORDER I.—ACERINEÆ.

Flowers regular. Sepals and petals equal in number, or the latter absent. Stamens usually 8, inserted above the disk when it is present. Fruit with 2 (or accidentally 3 or 4) indehiscent samaroid lobes. Seeds without an arillus and without albumen.

Generally trees, with the leaves always opposite, commonly palmately lobed, or pinnate with 3 to 5 leaflets. Sap often containing sugar.

GENUS I.—ACER. *Linn.*

Flowers generally polygamous. Calyx 5- more rarely 4- to 12-partite, deciduous, imbricated, often coloured. Petals as many as the calyx lobes or absent. Stamens usually 8, but from 4 to 12, inserted in various modes upon the annular disk. Filaments longer in the male flowers than in the others. Fruit of 2 divaricate indehiscent winged lobes or samaræ. Seed 1 (more rarely 2).

Trees of various stature, frequently with saccharine juice, with hard white wood. Leaves opposite, stalked, more or less deeply palmately lobed or partite. Flowers in short racemes or corymbs, yellowish or greenish, appearing with or before the leaves in spring.

The name of this genus is really a Latin word, which signifies strong or hardy, because the wood is compact and close-grained, and was formerly much sought after for making pikes and lances.

SPECIES I.—ACER PSEUDO-PLATANUS. *Linn.*

PLATE CCCXX.

Reich. Ic. Fl. Germ. et Helv. Vol. V. *Sapind.* Tab. CLXIV. Fig. 4829.

Leaves palmately 5-lobed; the lobes acute and again slightly lobed and coarsely serrate; the sinus between the lobes acute; under side opaque, whitish. Flowers numerous, in elongated drooping racemose panicles. Wings of the fruit widening out towards the apex, the angle included between their outer margins less than a right angle.

In hedgerows and open woods. Common throughout the country, but doubtfully native.

England, Scotland, Ireland. Tree. Spring.

A large tree, often 50 feet or more high, with the branches ascending or spreading. Bark rather smooth, pale olive. Leaves opposite, on petioles as long as themselves, 4 to 8 inches across, with 5 acute or acuminated lobes not extending half-way to the base of the leaf. Flowers greenish, $\frac{1}{4}$ inch across, in shortly-stalked racemes; raceme 3 or 4 inches long, with a few of the pedicels towards the base branched so as to be really a panicle, at first very compact and conical with a blunt apex, afterwards becoming more lax. Pedicels longer than the calyx. Sepals strap-shaped. Petals resembling the sepals, but narrower. Stamens generally 8. Style with 2

recurved branches, stigmatiferous on the inner side. Fruit of 2 samaræ or winged nuts about the size of peas, united together; the wings distinct, membranous, projecting about 1¼ to 1½ inch beyond the nut, nearly straight on the back, along which run parallel veins, of which one after the other turns off abruptly and ramifies towards the inner side, which is curved throughout. Leaves dark green above, whitish beneath, and woolly along the principal veins, especially when young. Peduncles, pedicels, inner side of the sepals, filaments, and especially the young fruit, hairy.

Sycamore, Great Maple.

French, *Érable Sycomore.* German, *Weisser Ahorn.*

The first record of the Sycamore tree as cultivated in Britain is in Turner's Herbal in 1551, and we still find it a favourite in all plantations, and around many of our English homesteads. Ray speaks of it as very common in courtyards, avenues, and churchyards in his time, but says it was objected to on account of the large number of falling leaves which it scatters about in autumn. Gerarde, in 1597, does not mention the Sycamore tree as being very common in England, but says: "The great Maple is a stranger in England, only it groweth in the walkes and places of pleasure of noblemen, where it especially is planted for the shadow sake, and under the name of Sycamore tree." It is still in request for beautiful massive foliage, which forms an almost impenetrable shade against the heat of summer, and in a landscape is an attractive object to the artist's eye, with its well-contrasted masses of light. It grows very rapidly, is easily transplanted, and does not injure the grass, which grows under its shadow. Its bark has not the furrowed roughness of the oak; but it has a seamed, knotted and gnarled appearance nearly as picturesque. In itself it is smooth, but it peels off in large flakes like the planes, leaving patches of different hues, seams and cracks, which are very striking. In rural scenery its luxuriant foliage, of a bright green colour, is very ornamental, and its praises have been sung by poets both ancient and modern. We read of—

> "The sycamore capricious, mature,
> Now green, now tawny, and ere Autumn yet
> Have changed the wood in scarlet honours bright."

The largest known tree is that at Bishopston, in Renfrewshire, which has grown to 60 feet in height and 20 feet in girth. This tree is known to have been planted before the Reformation, and is supposed not to be less than 300 years old, yet it has the appearance of being perfectly sound. According to Mordeath it was known in Charles II's time as "the big tree of Kippenross." It was once generally believed that the Sycamore mentioned in Scripture was our present species the Great Maple, but this is evidently an error, and the tree on to which Zaccheus climbed to see "Christ pass on his way to Jerusalem" has been proved to have been the Ficus sycamorus, a tree very common by the waysides of Judæa. The wood of the Sycamore tree when young is white, soft, but very compact, and even in the grain—qualities that recommend it to the turner. Cabinet-makers, wheelwrights, musical instrument makers, and makers of toys use this wood largely. The roots, which are often beautifully veined, and the stumps where the branches have been cut off, are sought after for inlaying, veneering, and curious cabinet work. According to M. Hartig,

a German writer on forest trees, the wood of the Sycamore is the most valuable of all woods for fuel, both on account of the heat it gives out and the time it continues to burn. Converted into charcoal it is also superior to all other woods. The leaves when cut down and dried form an excellent forage for sheep during the winter. The sap has been drawn from the trees in Germany, and many experiments made with it. It contains a large quantity of sugar; thirty-six quarts of sap have been obtained from one tree in five days, and, according to Sir Thomas Dick Lauder, who tried the experiment at Carron Park, Stirlingshire, in 1816, one hundred and sixteen parts of juice yielded one of sugar. In the Western Highlands and some parts of the Continent it is fermented and made into wine, the trees being tapped when just coming into leaf. In Scotland children often amuse themselves by cutting openings in the bark and sipping the sap that flows from the wounds. They also play with the large buds that are found on the points of the shoots, which they call "cocks," and the small side-buds "hens." We are reminded by the saccharine nature of the common Sycamore of its near transatlantic relative the Sugar Maple, whose delicious juice forms a most important article in the domestic economy of every New Englander, either in the form of solid sugar-cakes or a thick luscious syrup. In Scotland the Sycamore tree is often called the Plane tree, and in England it is sometimes known as the Mock Plane. It is the badge of the Oliphant clan of Highlanders.

SPECIES II.—ACER CAMPESTRE. *Linn.*

PLATE CCCXXI.

Reich. Ic. Fl. Germ. et Helv. Vol. V. *Sapind.* Tab. CLXII. Fig. 4825.

Leaves palmately 5-lobed, the lobes scarcely acute and again slightly lobed but not serrate; the sinus between the lobes rather acute; underside opaque green. Flowers few, in short, sub-erect corymbose panicles. Wings of the fruit nearly the same width throughout, their backs nearly in a straight line.

In woods and hedgerows. Common in England, but probably not native in Scotland.

England, [Scotland], Ireland. Tree. Spring and Early Summer.

Generally much smaller than A. Pseudo-platanus, being rarely above 20 feet high, and more frequently under 10. Leaves generally from 2 to 4 inches across, with the lobes sub-parallel for half their length, or even narrowed at the base, usually with a few rounded teeth or small lobes, but destitute of the numerous serratures of the preceding species. Panicle much shorter, 1 to 2 inches long, with the lower branches so elongated as to convert it into a corymb. Pedicels much longer than those of the last species. Flowers similar. Fruit like that of A. Pseudo-platanus, but with the two divisions diverging so much that their wings are brought into nearly the same line, and the latter are less dilated towards the apex. Leaves brighter green, paler but not white below, more

downy, especially when young. Peduncles, pedicels, sepals, and young fruit hispid-downy.

In both these species of Acer the fruit has occasionally 3, or even 4 lobes, instead of only 2.

Common Maple.

French, *Érable Commun.* German, *Massholder, Feld Ahorn.*

This species of Maple, though seldom of sufficient size to afford valuable timber, is much prized for the beautiful wood it affords to the cabinet-maker. It was celebrated amongst the ancient Romans, and of beautifully marked specimens of Maple wood we find the celebrated Tigrin and Pantherine tables were constructed. Some curiously veined and variegated knobs of this wood are said to have been worth their weight in gold. In the time of Virgil we may suppose it was much esteemed, for he writes—

> "A maple throne raised higher from the ground
> Received the Trojan chief."

Pliny mentions the curious knobs and excrescences of this tree, which in their contortions often represent the heads or figures of birds, beasts, or odd creatures of the imagination, and we have recently seen a collection of walking-sticks the handles of which were formed into all sorts of curious devices from the natural growths of the Maple and other trees. The wood is very valuable to the turner, and is of so good a texture that vessels may be produced so thin as to transmit light. The young shoots being tough and flexible are employed in some parts of France by coachmen as whips Though small and dwarfish in size, owing in a great measure to the practice of continually clipping off the branches, when allowed to grow freely the Maple has been known to exist for more than two centuries; and at Knowle, in Kent, the Duke of Dorset's seat, is one specimen measuring 12 to 14 feet in height. When allowed to grow in this way the timber makes excellent gun-stocks and screws for cider-presses. In the spring we often find the younger foliage of the Maple covered over with little red spots, which are proved to be caused by the puncture of an insect when forming a nidus to deposit its eggs. Dr. Withering mentions that to the admirers of the picturesque and the lovers of human nature the Maple tree has acquired additional interest from the fact that beneath its shade rest the remains of the good and exemplary parish priest Gilpin, whose love of nature was in harmony with his love of all that was good and true. The Maple tree written of by Pliny had its reputation in medicine. Gerarde, who devoutly quotes this old author, himself says: "What use the Maple hath in medicine we find nothing written of the Grecians, but Pliny in his 14 booke, 8 chapter, affirmeth 'that the root pouned and applied is a singular remedy for the paine of the liver.' Serenus Sammonicus writeth that it is drunke with wine against the paines of the side."

> "Thy harmlesse side if sharpe disease invade,
> In hissing water quench a heated stone;
> This drinke. Or maple root in powder made
> Take off in wine, a present med'cine knowne."

Sub-Order II.—STAPHYLEÆ.

Flowers perfect, regular. Stamens 5, inserted on the outer edge of the disk. Seeds with or without an arillus, albuminous. Embryo straight.

Shrubs or trees with opposite pinnate trifoliate or more rarely simple leaves.

GENUS II.—STAPHYLEA. *Linn.*

Flowers regular. Sepals 5, deciduous, coloured. Petals 5, erect. Stamens 5, inserted outside the disk, which lines the bottom of the calyx and is lobed on the margins. Capsules membranous, bladdery, 2- or 3-lobed, 2- or 3-celled; the cells generally 1-seeded, opening at the apex. Seeds roundish-obovate without an arillus; seed-coat bony; albumen fleshy.

Branched shrubs with opposite stipulate 3- or 5-foliate pinnate leaves; leaflets with stipels. Flowers white, pendulous, in axillary drooping racemes or panicles. Fruit large.

The name of this genus is supposed to be an abbreviation of "Staphylodendron," its name in ancient botany, signifying σταφυλη (*staphyle*), a bunch or cluster, and δενδρον (*dendron*), a tree; the flowers and fruits are disposed in clusters.

SPECIES I.—STAPHYLEA PINNATA. *Linn.*

PLATE CCCXXII.

Reich. Ic. Fl. Germ. et Helv. Vol. V. *Sapind.* Tab. CLXI. Fig. 4823.

Leaves pinnate, with 2 to 3 pairs of elliptical leaflets and a terminal one. Petioles without glands. Flowers in drooping short racemose panicles. Styles generally 2. Fruit 2-lobed; lobes bladdery, apiculate.

In hedgerows and plantations, but having no claim to be considered native.

[England, Scotland]. Shrub. Summer.

A large shrub, generally from 6 to 10 feet high. Leaves with the leaflets 2 to 4 inches long, finely and minutely serrulate at the margins. Peduncles long, produced from the termination of the shoots of the year. Inflorescence 1 to 2 inches long, interrupted at the base. Pedicels simple or slightly branched, articulated near the middle. Flowers ½ inch long. Divisions of the calyx oblong, whitish, reddish or fawn-coloured externally. Petals white,

nearly erect. Fruit green, resembling a spherical loose bladder 1 inch in diameter. Seed not nearly filling the cavity of the capsule, about ½ inch long, obovate-compressed, greyish-olive, with a very hard smooth shining seed-coat. Leaves deep green, glaucous beneath. Plant glabrous.

Common Bladder-Nut.

French, *Staphylier Ailé.* German, *Gemeine Pimpernuss.*

None of the species of this genus possess any beauty, but are cultivated in gardens and nurseries to mix with other shrubs for variety. Their singularity perhaps more than anything else procures them a place in the shrubbery. Gerarde tells us "it groweth in the garden of the Right Honourable the Lord Treasurer, my very good lord and master, and by his house in the Strand. Pliny hath written of it: 'The timber whereof is very like to that of white Maple.'" Our good friend, who was always willing to find some "vertue" in every plant of which he writes, says: "The nuts are moist and full of superfluous raw humours, and therefore they easily procure a readiness to vomit and trouble the stomacke, and therefore they be not to be eaten." Haller says children eat the kernels; but it must have been hardy children that did so, if we are to believe Gerarde. The nuts being smooth and hard are sometimes appropriated to chaplets of beads or rosaries by Roman Catholics.

ADDENDA TO VOL. II.

After Helianthemum polifolium, at page 11 :—

EXCLUDED SPECIES.

HELIANTHEMUM LEDIFOLIUM. *Willd.*

Cistus ledifolius, *Linn. Sm.* E. B. 2414.

Said to have occurred on Brent Down, Somersetshire, but not now to be found there. Doubtless introduced into the British Flora through an error as to the species observed.

After Viola Reichenbachiana, at page 21 :—

VIOLA ARENARIA. *D.C.*

PLATE CLXXIV. (*bis*).

V. Allionii Pio, *Reich.* Ic. Fl. Germ. et Helv. Vol. III. *Viol.* Tab. IX. Fig. 4500.

Rootstock slender, somewhat woody, scarcely creeping, simple, terminating in an extremely short leafy stem, and also giving off from axillary buds rather short decumbent-ascending lateral stems, from the axils of the leaves of which peduncles are produced. Leaves stalked; the lower ones deltoid-roundish, acute, deeply

cordate at the base; the upper ones narrower; all faintly crenate. Stipules small, sub-membranous, triangular-ovate, fimbriate at the edges. Spur of the lower petal three times as long as the appendages of the sepals. Anther spurs narrow, longer than the anther together with its apical scale. Style thickened towards the apex and curved. Capsule oblong-acute, 3-sided, covered with short pubescence, which also clothes the peduncles and young leaves.

On the sugar limestone at the upper end of Teesdale, on the north side of the river; discovered by the Messrs. Backhouse, of York.

England. Spring and (apetalous flowers) Summer. Perennial.

Very like small examples of V. Riviniana, with which it agrees in the shape of the flowers, the numerous veins of the lower petal, and the relative size of the appendages of the sepals; but the corolla is, according to Mr. Backhouse, pale slaty blue, the mode of growth more compact, the leaves rounder, and the plant decidedly downy, the down being very thick on the peduncles and on the ribs of the capsule.

This species seems so universally recognised on the Continent, that it probably deserves to be considered as such, and not merely as a sub-species of V. sylvatica, in which light I should otherwise have been inclined to regard it, from the examination of dried specimens; the living plant I have not had an opportunity of examining. Although I have not seen the British specimens of this plant, yet there can be no doubt respecting its occurrence, as Professor Babington indorses the report of the Messrs. Backhouse in a paper in Seeman's "Journal of Botany," 1863, p. 325.

Sand Dog-Violet.

French, *Violette des Sables.* German, *Sand-Veilchen.*

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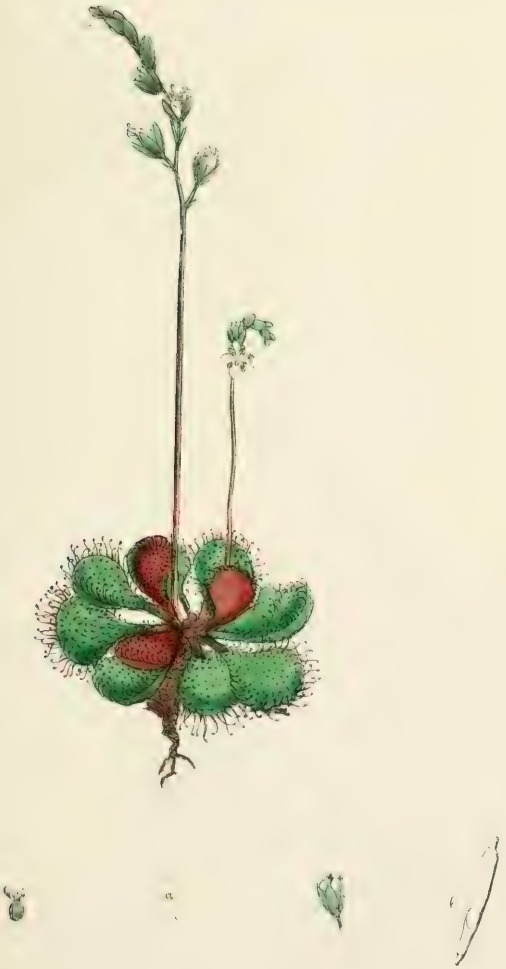

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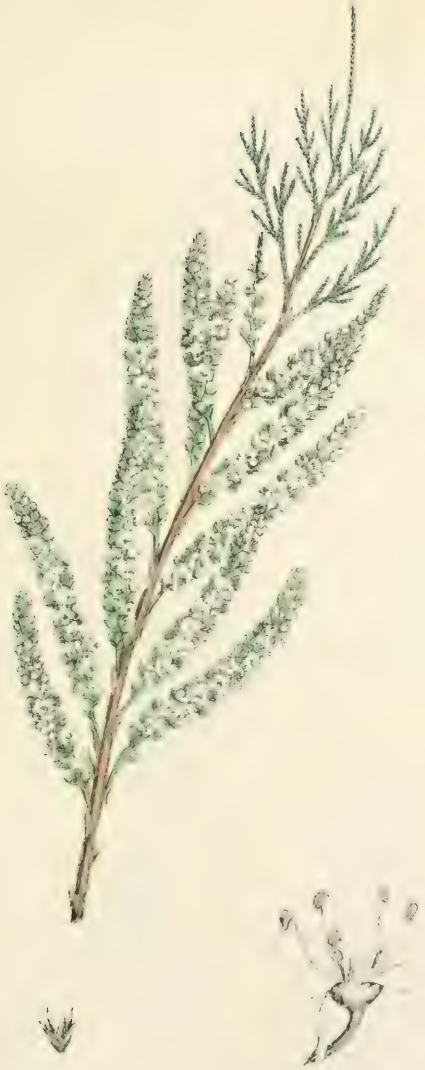

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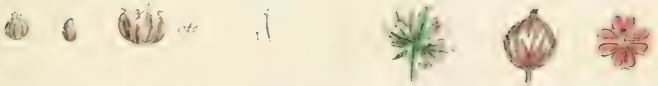

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